Fetal Alcohol Spectrum Disorder: Prevalence, Comorbidities, and Cost

Presented by
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The House of Commons’ on Justice and Human Rights
The subject matter of Bill C-583
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Fetal Alcohol Spectrum Disorder

• If a mother drinks alcohol during pregnancy the fetus drinks too, and therefore, the child may be born with FAS or FASD

• Diagnosis is made when a patient is found to have abnormalities in three areas:
  I. Prenatal and/or postnatal growth retardation
  II. Central nervous system (CNS) abnormalities
  III. Characteristic facial anomalies
Specific facial phenotypic features

Small head circumference
Short palpebral fissures (short eye openings)
Indistinct/smooth philtrum (groove above the lip)

Epicanthic folds
Low nasal bridge
Short nose
Short midface
Thin upper lip

Presence of 3 specific phenotypic facial features:
1) short eye openings (palpebral fissures),
2) smooth or flattened philtrum,
3) thin upper lip
Brain damage due to prenatal alcohol exposure

FAS is a leading cause of brain damage in newborns

5-day-old infant with FAS 5-day-old infant (control)

Adapted from Clarren, 1986
Facial features of FAS in the mouse

Control

Exposed with high doses of alcohol: small eye openings, long flat area under the nose (philtrum)

Adapted from Sulik & Johnston, 1982
FAS – only the tip of the iceberg

- Partial Fetal Alcohol Syndrome (pFAS)
- Fetal Alcohol Effects (FAE)
- Alcohol-Related Neurodevelopmental Disorder (ARND)
- Alcohol-Related Birth Defects (ARBD)
Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term that covers several alcohol-related medical diagnoses.
What are the effects of FAS/D?

- Mental and physical disabilities
- Problems associated with behaviour and learning
- Problems with memory, speech, attention, and problem solving
- “Secondary disabilities”: mental health problems, substance abuse, inappropriate sexual behaviour, disrupted school experience, unemployment, and trouble with the law

Irreversible and lifelong!
Why trouble with the law?

- Learning disabilities,
- Impulsivity,
- Poor judgment and abstracting abilities,
- Slow information processing,
- Poor comprehension of social rules and expectations, and
- Lack of ability to learn from past experiences

- Increase susceptibility to delinquency, criminal behavior and victimization
Prevalence of FAS in Canada

General Population vs. Northern Communities

(Range: 0.1% to 0.7%)  (Range: 3.7% to 12.1%)

<table>
<thead>
<tr>
<th>Region</th>
<th>General population</th>
<th>Northern communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest BC</td>
<td>0.1%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Yukon</td>
<td>0.7%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>Canada (National)</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>Northern BC</td>
<td></td>
<td></td>
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<tr>
<td>Manitoba</td>
<td></td>
<td></td>
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<tr>
<td>Maritimes</td>
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</tbody>
</table>

Sources:
- Asante & Nelms-Matzke, 1985
- Asante & Nelms-Matzke, 1985
- Habbick et al., 1996
- Roberts & Nanson, 2000
- Robinson et al., 1987
- Kowlessar, 1997
- Cox, 2007
## Prevalence of FASD in Canada

### General Population vs. Northern Communities

<table>
<thead>
<tr>
<th>Location</th>
<th>General Population</th>
<th>Northern Communities</th>
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</thead>
<tbody>
<tr>
<td>National</td>
<td>0.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Yukon</td>
<td>1.3%</td>
<td>19.3%</td>
</tr>
<tr>
<td>Northwest BC</td>
<td>1%</td>
<td>19%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>10.1%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Maritimes</td>
<td>19.3%</td>
<td>19.3%</td>
</tr>
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Prevalence of incarceration of people with FAS/D in the criminal justice system

• Anecdotal estimate: 50% of young offenders in Canada have FASD (Zakreski, 1998)

• Among 253 people with FASD, 60% reported ever being charged, convicted, or in trouble with the authorities, and 42% of adults had been incarcerated for a crime (USA study; Streissguth et al., 1996)
Prevalence of FASD in Correctional System, Canada
(Range among youths: 10.9% to 23.4%)

Comorbidities associated with FASD

• Comprehensive literature review and meta-analysis (Popova et al., The Lancet, in press)

• Based on the data reported in 125 studies, 441 comorbid conditions were identified that occur in individuals with FASD

• The comorbid conditions span across 18 (out of 22) chapters of the International Classification of Diseases, version 10 (ICD-10)

• The most prevalent disease conditions identified to occur among individuals with FASD were:
  • *Congenital malformations, deformities and chromosomal abnormalities* (Q00-Q99; Ch. XVII), &
  • *Mental and behavioural disorders* (F00-F99; Ch. V)
Comorbidities associated with FASD

- 43%: Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)
- 19%: Mental and behavioural disorders (F00-F99)
- 9%: Diseases of the eye and adnexa (H00-H59)
- 4%: Diseases of the ear and mastoid process (H60-H95)
- 6%: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)
- 1%: Neoplasms (C00-D48)
- 1%: Endocrine, nutritional and metabolic diseases (E00-E90)
- 1%: Mental and behavioural disorders (F00-F99)
- 1%: Diseases of the nervous system (G00-G99)
- 1%: Diseases of the eye and adnexa (H00-H59)
- 1%: Diseases of the ear and mastoid process (H60-H95)
- 1%: Diseases of the circulatory system (I00-I99)
- 1%: Diseases of the respiratory system (J00-J99)
- 1%: Diseases of the digestive system (K00-K93)
- 2%: Diseases of the skin and subcutaneous tissue (L00-L99)
- 2%: Diseases of the musculoskeletal system and connective tissue (M00-M99)
- 2%: Diseases of the genitourinary system (N00-N99)
- 2%: Certain conditions originating in the perinatal period (P00-P99)
- 2%: Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)
- 2%: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)
- 2%: External causes of morbidity and mortality (V01-Y98)
- 2%: Factors influencing health status and contact with health services (Z00-Z99)
Comorbidities associated with FASD

Conditions within the *Mental and Behavioural Disorders* (F00-F99) category with a prevalence >35%
Comorbidities associated with FASD

Pooled prevalence of comorbid conditions in individuals with FAS and among the general population of the USA

<table>
<thead>
<tr>
<th>Condition</th>
<th>FAS Prevalence</th>
<th>General Population Prevalence</th>
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</thead>
<tbody>
<tr>
<td>Conduct disorder</td>
<td>9.5 times</td>
<td>10.3 times</td>
</tr>
<tr>
<td>Receptive language disorder</td>
<td>77.0 times</td>
<td>11.1 times</td>
</tr>
<tr>
<td>Chronic serous otitis media</td>
<td>97.5 times</td>
<td>5.6 times</td>
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<tr>
<td>Expressive language disorder</td>
<td>128.7 times</td>
<td>31 times</td>
</tr>
<tr>
<td>Unspecified disorder of psychological development</td>
<td>126.2 times</td>
<td>4.4 times</td>
</tr>
<tr>
<td>Other preterm infants</td>
<td>126.2 times</td>
<td>4.4 times</td>
</tr>
<tr>
<td>Visual impairment including blindness (binocular or monocular)</td>
<td>7.6 times</td>
<td>4.4 times</td>
</tr>
<tr>
<td>Sensorineural hearing loss, unspecified</td>
<td>7.6 times</td>
<td>4.4 times</td>
</tr>
<tr>
<td>Conductive hearing loss</td>
<td></td>
<td></td>
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<tr>
<td>Alcohol and drug dependence</td>
<td></td>
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<tr>
<td>Disturbance of activity and attention</td>
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FAS: Fetal Alcohol Syndrome
General population
Percentage of main cost components attributable to FASD in Canada in 2013
Total annual cost: $1.3 B - $2.3 B

Due to the organic brain damage caused by alcohol, and the resulting cognitive, functional, and behavioural deficits, people with FASD are at high risk for becoming involved in the legal system, either as offenders or as victims.

Given that people with FASD do not generally learn from past experiences, along with the other mental health problems, recidivism rates tend to be high.

Youths with FASD were 19 times more likely to be incarcerated than youths without FASD on any given year in Canada.

Law Enforcement: Cost of Corrections

<table>
<thead>
<tr>
<th></th>
<th>Youths</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>$13.6M</td>
<td>$317.0M</td>
</tr>
<tr>
<td>Females</td>
<td>$3.9M</td>
<td>$39.2M</td>
</tr>
<tr>
<td></td>
<td>$17.5M</td>
<td>$356.2M</td>
</tr>
</tbody>
</table>

$317.0M
$13.6M
$3.9M
$17.5M

$330.7M
$43.0M

Law Enforcement: Cost of Corrections

• Awareness needs to be raised regarding the prevalence and disabilities of individuals with FASD in the criminal justice system

• Intervention efforts aimed at rehabilitation and the prevention of recidivism among FASD-affected individuals are necessary

• The data and the resulting estimates of the current study emphasize the need for incorporating FASD screening as early as possible in the criminal justice process
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