Vaccination and Infant Death

A Possible Link to Inborn Errors of Metabolism Detected Through The Metabolic Autopsy

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Neo Gen Screening
Known Facts

- ~1% of Infant Deaths (>1% of SIDS) are can be diagnosed as one of several inborn errors of metabolism.

- Death can occur “suddenly” from undiagnosed Fatty Acid Oxidation Disorders (IEMs).

- Deaths clustered at specific periods when fat metabolism is increased.
  - Birth
  - Illness
  - Fasting

- Vaccinated infants:
  - At risk for metabolic decompensation.
  - Death due to metabolic disorder, not vaccine is possible.
Metabolic Autopsy
What is it?

- Blood and/or Bile specimen collected at autopsy and sent to specialty laboratory for modified IEM screen.

- Blood/Bile is applied to filter paper (similar to newborn screening) and sent via standard post or courier.

- Analysis of blood using Tandem Mass Spectrometry for >35 disorders.
  - Clinical Chemistry 2001, 47, 1166 – 1182
Screening Statistics

- 10,783 Total Specimens Received through January 31, 2002.

- Blood, Bile, Tissue and Urine Received from US, Canada, Mexico & India

- Specimens received from
  - ME’s
  - Pathology Laboratories

- High specialized analysis available in only 4 laboratories in the US.
## Complete Postmortem Findings

<table>
<thead>
<tr>
<th>Disorder</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCAD Def.</td>
<td>30</td>
</tr>
<tr>
<td>VLCAD Def.</td>
<td>11</td>
</tr>
<tr>
<td>MADD (GA-II)</td>
<td>12</td>
</tr>
<tr>
<td>CPT II / Translocase</td>
<td>6</td>
</tr>
<tr>
<td>Carnitine Def. / Uptake</td>
<td>7</td>
</tr>
<tr>
<td>LCHAD / TFP Def.</td>
<td>10</td>
</tr>
<tr>
<td>SCHAD Def.</td>
<td>2</td>
</tr>
<tr>
<td>GA-I</td>
<td>3</td>
</tr>
<tr>
<td>IVA / 2-MeBuCoAD Def.</td>
<td>5</td>
</tr>
<tr>
<td>Other Disorders</td>
<td>10</td>
</tr>
</tbody>
</table>
Molecular Confirmation

- **MCAD Deficiency**
  - 30 Total
    - 19 homozygous A985G mutation
    - 8 heterozygous (Compound) A985G mutation
    - 3 inconclusive

- **LCHAD Deficiency**
  - 10 Total
    - 5 homozygous G1528C mutation
    - 3 heterozygous (Compound) G1528C mutation
    - 1 Trifunctional Protein Deficiency (TFP Def.)
    - 1 inconclusive LCHAD / TFP (no copies G1528C)
96 Deaths Explained
10,783 Specimens
0.9 % “Frequency”
Population

- Not just SIDS
  - SIDS defined differently by different M.E.
    - SIDS not SIDS with a diagnosis.

- Included in suspect cause of infant death:
  - SUDS (Unexplained death in children/adults)
  - Homicides
  - Accidental Deaths
  - Stillbirths
  - Premature Infant Deaths
  - Suffocation / Co-Sleeping
  - Abortions
  - Infection, other diseases
  - VACCINES?
More Facts

- 14% of IEM deaths have occurred before newborn screening using MS/MS would likely have been effective (<3 days).

- Another 12% may or may not have been found in time using MS/MS (<7 days) depending on the program and turn-around time.

- Less than 5% occurred in regions performing MS/MS and not reported.

- Recent data suggests the incidence is decreasing as newborn screening increases.
Demographic Information

The following map shows the demographic information of highly presumptive deaths due to metabolic abnormalities.

Note that the high occurrence in a particular region may reflect activity by the medical examiners office rather than incidence of disease.

Screening population varies by submitter.
SUMMARY

- Postmortem Metabolic Screening has provided important public health information.
  - Metabolic disorders can result in the premature death of an infant or child if undiagnosed.
  - Nearly 1% of cases submitted to our laboratory has been assigned a highly presumptive or confirmed IEM disorder.

- Expansion of comprehensive screening programs should reduce the number of these deaths by nearly 50%
  - MCAD Deficiency accounts for 1/3 of the cases.
IMPACT

- Of the 4.5 million infants born this year – approximately 500 infants will die unexpectedly from a metabolic disorder.

- The majority of these cases are preventable through early screening and treatment.

- Can awareness of IEM can prevent complications of vaccinations in affected individuals?
  - In fact metabolic treatment of IEM does require fasting prevention and extreme caution during times of illness or circumstances increase fat turnover or increased glucose utilization.
Unknowns

- How many SIDS cases with a positive diagnosis of an IEM occurred within 7 days of a vaccination?

- What does vaccination produce in patients with known metabolic disorders?