

# 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

MCAD Def.	30
VLCAD Def.	11
MADD (GA-II)	12
CPT II / Translocase	6
Carnitine Def. / Uptake	7
LCHAD / TFP Def.	10
SCHAD Def.	2
GA-I	3
IVA / 2-MeBuCoAD Def.	5
Other Disorders	10

# 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)

# Statistics

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 (<7days) 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?