

SAMM Kids

Adverse Delivery Outcomes

The Maternal-Infant Care Continuum



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Ministry of Health 2014-2017

Presentation Today

- WHRC
- SAMM Kids Study
- SAMM Study
- Themes identified
- Take home messages

Women's Health Research Centre (WHRC)

Kaupapa Māori Research

Process: Consultation and partnership with researchers, communities, Kaumātua, stakeholders & policy makers

Actions: Finding the facts
Finding the solutions

Research Study Teams

SAMM + SAMM Kids (WHRC)

Bev Lawton (Director, WHRC)
Stacie Geller (Professor Obstetrics & Gynaecology)
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Fiona Cram (Katoa/Māori HRC)
Kendall Stevenson (WHRC)

Francesca Storey (Research Fellow, WHRC + Ex NICU CCDHB)

Women's Health Research Centre

Why Study SAMM Kids?

- WHRC research into SAMM mothers showed a high rate of adverse fetal & infant outcome
- SAMM Kids examined delivery outcomes of SAMM mothers using a continuum of care pathway from mother → delivery → early neonatal care
- Neonatal staff joined the WHRC team

The SAMM Study Came First

- Severe acute maternal morbidity (SAMM)
- WHO: “the near death of a woman who has survived a complication occurring during pregnancy or childbirth or within 42 days of the termination of pregnancy”

Maternal Morbidity

- Maternal mortality has not declined in 2 decades
- Tip of the iceberg - *more* women experiencing SAMM events
- Need to understand maternal morbidity
- Greater power to investigate preventable factors
- Clarify disparities in rates of preventable morbidity for indigenous and minority groups

SAMM Process*

- National process, first of its kind globally
- > 200 expert clinicians from all 20 DHBs recruited
- 6 teams of 10-15 clinicians meeting 3 monthly
- 460 SAMM cases reviewed:
- Criteria: a woman who was admitted to ICU or HDU at any time during pregnancy or within 42 days of delivery (Aug 2013 – Jan 2015)

* MacDonald EJ GS, Lawton B. Establishment of a National Severe Maternal Morbidity Preventability Review in New Zealand. Int J Gynecol Obstet 2016.

Preventability of Maternal Morbidity & Mortality

- **Goal:** To identify preventable factors associated with increased progression along the continuum of maternal morbidity



- **Q:** Did the woman need to get as sick as she did?

Preventable Event

“Any action or inaction on the part of the health care provider, the system or the patient that may have caused or contributed to progression to more severe morbidity or death”

Preventability Model

- From the maternal morbidities and deaths deemed preventable, Geller *et al* developed a model of preventability
- Adapted for New Zealand and validated

Categories of Preventability

Assessment/Point of Entry

Diagnosis/Recognition of High Risk

Refer to Expert

Treatment

Management hierarchy

Education

Communication

Policies and procedures

Documentation

Discharge

Preventability Review

Case presented, discussed and consensus achieved:

- *Potentially preventable*
- *Not preventable but improvement in care needed*
- *Not preventable*

Results: Overall Preventability*

38.8% SAMM potentially preventable

**36.7% SAMM not preventable but
improvement in care needed**

24.5% SAMM not preventable

Lawton B, MacDonald EJ, Brown SA, Wilson L, Stanley J, Tait JD, et al.
Preventability of severe acute maternal morbidity. *Am J Obstet Gynecol* 2014;210(6):557.e1–6.

Discussion: Preventability

- Majority of preventability association was specifically due to **provider factors**
- **Changes in provider decision-making** could reduce the severity of SAMM
- Such changes in provider decision making **could impact upon and affect delivery outcomes**

Which Brings Us To SAMM Kids

Delivery Outcomes

Considering the delivery outcome, a cohort of 98 SAMM mum cases were examined:

- 12 miscarriages (<20/40), 7 still born (>20/40)
- Total 19 losses (40% Māori and 26% NZE)
- Of the 79 live-born 24% showed signs of hypoxia (10% Māori and 4% NZE)
- Indicated that SAMM → ↑ risk of adverse delivery outcome

- Consistent with Scottish data: infants of SAMM mothers 8 x more likely to die or suffer adverse outcome*
- Little international literature examines the maternal infant care continuum and potential preventability of fetal/infant adverse outcomes

*Healthcare Improvement Scotland. Scottish Confidential Audit of Severe Maternal Morbidity: reducing avoidable harm. National Health Service for Scotland, 2013

SAMM Kids

- HRC funded this new research study
- To investigate delivery outcomes for women who have experienced a SAMM event as well immediate neonatal care
- SAMM Kids will also explore the burden of adverse events for Māori whānau

Study overview

1st January -31st December 2014
SAMM Events
~400

Examine *all* delivery
Outcomes
N=~400

Adverse delivery
outcomes for review
N=~100

Adverse Delivery Outcome

- Definition:
 - Death
 - Neonatal encephalopathy
 - Severe hypoxia (Apgar < 7 at 5 minutes)
 - Admission to NICU
- → 107 panel (some excluded)
- These are triggers used to identify adverse outcomes

SAMM Kids Process

- Maternal NHIs matched by MOH to infant NHI (delivery outcome unknown)
- Infant notes from DHBs de-identified
- Data collected
- Delivery outcome determined
- Summaries written for panel cases

Review Panels

- 2 review panels – approx 10-12 experts
- Division of DHBs (10 meetings held)
- Panels do not review cases from the DHB in which they work or have transfers
- Panel members discuss details of each case

The New Maternal-Fetal-Infant Care Pathway (perinatal)



- Was the adverse delivery outcome potentially preventable?
- Was this neonatal morbidity potentially preventable?
- Did the baby become sicker than it had to?

Assessing a Case

- The preventability model examines clinician, system and patient factors in detail:
 - The maternal factors that may have impacted on the delivery outcome
 - The care factors that may have impacted on neonatal morbidity

SAMM Kids Findings

- Findings are close to being published
- Predominant themes commented upon by panel concern:
 - Hypoglycaemia
 - Hypothermia
 - Importance of the perinatal team

Hypoglycaemia

- Neonatal BSL $< 2.6\text{mmol/L}$ is common
- Hypoglycaemia **is avoidable** in most circumstances
- At-risk infants need BSL monitoring
- Potential cause of neonatal morbidity
- On rare but tragic occasions causes long-term neurodevelopmental harm

NHS Litigation Review

- This review looked to identify themes that could alert clinicians to common pitfalls – ↑ patient safety
- Reviewed claims for injury 2° to NHG
- Reviewed anonymised documentation for 30 neonates (2002-2011)
- All claims related to babies of at least 36 weeks gestation
- * Hawdon J, Beer J, Sharp D & Upton M. Neonatal Hypoglycaemia: Learning from Claims. Arch Dis Child Fetal Neonatal Ed doi:10.1136/archdischild-2016-310936

The Potential Impact

- Most common risk factor was **LBW**
- Most common reported presenting sign was **abnormal feeding behaviour**
- A number of deficits in care were reported
- **All** of which were avoidable
- Damages were paid for 25 claims
- \$275,000,000 financial cost to the NHS

Hypoglycaemia in SAMM Kids

- Dex Gel used in hypoglycemic cases but background feed vol / freq often not ↑
- Rebound hypoglycemia follows and further Dex Gel / NNU admit ensues
- Persistent hypoglycemia not always promptly acted upon (maternity & neonatal care settings)
- Unclear as to whether senior reviews are sought for their management

Hypothermia in SAMM Kids

- Temp $<36.5^{\circ}\text{C}$ is abnormal \rightarrow rewarm
- Number of cases involve moderate hypothermia $<35.9^{\circ}\text{C}$
- Not always associated with being 'stressed' (less able to maintain temp)
- Unclear whether there were considerations of the hypothermia-hypoglycemia link

What's Next?

- Clinical & educational interventions to reduce preventable adverse outcomes
- Development of quality improvement interventions
- Contributions to policy changes and health promotion programmes
- Improvement in maternal morbidity & mortality
- Improved delivery and neonatal outcomes
- Potential ↓ personal/public health costs

Ultimate Goal is a Healthy Woman and Baby and Protection From Avoidable Adverse Outcomes



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