RISK FACTORS FOR DEATH FROM BIRTH ASPHYXIA

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INTRODUCTION

Birth Asphyxia

- Leading cause of perinatal death – developing and developed countries
- 5th most common cause of death under 5 years (Lawn et al.)
  
- 23% of estimated 4 million neonatal deaths
- 26% of 3.9 million still births (Lawn et al.)

- Western Pacific Region – 14% of 230,000 neonatal deaths annually


- Port Moresby – incidence 5.5/1000, mortality 31/1000 (G. Oswyn et al. 2000)

- Leading cause of neonatal deaths, SPH, 2012 –2014 (Annual reports)

- In resource rich countries the incidence is about 1/1000 live births
- Resource poor countries with data from hospital based studies suggests an incidence of 5–10/1000 live births.
Birth Asphyxia

WHO: “the failure to initiate and sustain breathing at birth”
- Mostly used in community based studies (home deliveries)
- Screens/identifies need for resuscitation
- Does not really predict the outcome of birth asphyxia (Lincetto, Geneva, 2007)

Asphyxiated neonate: (American College of O&G and American Academy of Paediatrics – 1996)
(1) Umbilical cord pH of < 7
(2) Apgar score of 0 – 3 for longer than 5 minutes
(3) Neurological manifestations (e.g. seizures, coma, or hypotonia)
(4) Multi-organ dysfunction e.g. cardiovascular, gastrointestinal

Apgar score and neurological manifestations have been used as criteria for the definition of birth asphyxia in our setting.
<table>
<thead>
<tr>
<th>AUTHOR COUNTRY</th>
<th>PLACE OF STUDY</th>
<th>Definition</th>
<th>FINDINGS ( RISK FACTORS)</th>
<th>Incidence Mortality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oswyn GPNG 2000</td>
<td>Tertiary Hospital</td>
<td>Abnormal neurological manifestations Apgar of&lt; 6 at 5/60</td>
<td>Risk factors to morbidity Previous still birth/ NND,fetal heart abnormalities, PROM, maternal fever, pre/post term, operative delivery</td>
<td>5.5/1000 31/1000</td>
</tr>
<tr>
<td>Anne CC Lee Nepal 2007</td>
<td>Community Based</td>
<td>All births</td>
<td>Risk factors to mortality low paternal education, primiparity, multiple births, maternal fever</td>
<td>10.5/1000 X</td>
</tr>
<tr>
<td>Ekta A Dalal India 2008</td>
<td>Tertiary Care Centre</td>
<td>Apgar &lt;7 at 1/60</td>
<td>Risk factors to morbidity maternal anaemia, primipara, meconium stained liquor,</td>
<td>6.6/1000</td>
</tr>
</tbody>
</table>
### LITERATURE REVIEW

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>COUNTRY</th>
<th>PLACE OF STUDY</th>
<th>DEFINITION</th>
<th>FINDINGS (Risk factors)</th>
<th>INCIDENCE MORTALITY RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badawi et al</td>
<td>Australia</td>
<td>Population based</td>
<td>Term infants with moderate or severe neonate encephalopathy</td>
<td>Maternal fever, persistent OP position, acute intrapartum event</td>
<td>3.8/1000</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ellis et al</td>
<td>Cameroon</td>
<td>Tertiary Hospital</td>
<td>Apgar &lt; 7 at 5/60</td>
<td>Single, place of antenatal visits, malaria, PET, Prolonged labour, PROM, non-cephalic presentation</td>
<td>80.5/1000 6.7/1000</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td></td>
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</tbody>
</table>

Incidence range: 3.8 – 80.1/1000 (Cameroon)
Mortality rate range: 6.7 – 31/1000

Tertiary Hospitals/Community Based studies
AIM
- Identify risk factors for death from birth asphyxia, antenatally, perinatally and post-partum

OBJECTIVES
- To review the antenatal and delivery records and identify risk factors
- To make recommendations and take preventive measures to reduce the number of babies born with birth asphyxia and improve the outcome.
METHODOLOGY

TYPE OF STUDY – Retrospective Descriptive Study

SETTING – Sandaun Provincial Hospital / Vanimo

STUDY POPULATION – 84 neonates admitted to Special Care Nursery with the diagnosis of Birth Asphyxia over 36 months: 2012 – 2014

INCLUSION CRITERIA
Neonates with apgar of <7 at one minute admitted to SCN

EXCLUSION CRITERIA
BBAs (n=2)
Babies born with congenital defects
METHODOLOGY

PROCEDURE

1. Collection and review of maternal and neonatal clinical records
2. Required data extracted using a prepared case questionnaire
3. Information gathered divided antenatal, perinatal, and post partum variables

DATA ANALYSIS
Data analysed using SSPS and Excel
# RESULTS

**BIRTH ASPHYXIA 2012 – 2014**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total deliveries</td>
<td>3232</td>
</tr>
<tr>
<td>Total live births</td>
<td>3152</td>
</tr>
<tr>
<td>Still births</td>
<td>80</td>
</tr>
<tr>
<td>SBR</td>
<td>24.7/1000</td>
</tr>
<tr>
<td>Total admission to SCN</td>
<td>832</td>
</tr>
<tr>
<td>No of birth asphyxia</td>
<td>107</td>
</tr>
<tr>
<td>No in study</td>
<td>84</td>
</tr>
<tr>
<td>Incidence of Birth Asphyxia</td>
<td>33/1000</td>
</tr>
<tr>
<td>Birth asphyxia mortality rate</td>
<td>21.4/1000</td>
</tr>
</tbody>
</table>
RESULTS

- A total of 107 babies admitted with Dx of birth asphyxia
- 2 BBAs excluded
- 21 maternal charts missing
- 84 included in study, 66 survived and 18 deaths
- 45 neonatal charts found (16 deaths/29 survivors)
- 5 minute Apgar recorded: 28
- 5 with 5/60 apgar scores of < 6 / all died
- 13% hypoglycaemia, 26.6% seizures, 13.3% apnoeas
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total with characteristics (if categorical)</th>
<th>No characteristic who died</th>
<th>No with characteristics who survived</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Or Median (IQR) if continuous (n = 84)</td>
<td>Or median (IQR) if continuous among those who died (n = 18)</td>
<td>Or median (IQR) if continuous among those who survived (N = 66)</td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td>Median 2</td>
<td>Median 2</td>
<td>Median 2</td>
<td>No statistical sign.</td>
</tr>
<tr>
<td>Booking status</td>
<td>72(85.7%) BKD</td>
<td>15(83.3%) BKD</td>
<td>57(86.36%) BKD</td>
<td>No statistical sig.</td>
</tr>
<tr>
<td>Hx of NND</td>
<td>7 (8.3%)</td>
<td>1 (5.5%)</td>
<td>8 (12.12 %)</td>
<td>Not statistical sig.</td>
</tr>
<tr>
<td>Hx of PV bleeding</td>
<td>2 (2.38%)</td>
<td>1 (5.5%)</td>
<td>1 (1.5%)</td>
<td>Not statiscal sig.</td>
</tr>
<tr>
<td>Severe anaemia/transfused</td>
<td>16 (19.04%)</td>
<td>9 (50%)</td>
<td>7 (10.60%)</td>
<td>Chi square P value &lt;0.001</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Total with characteristic (if categorical)</td>
<td>No with characteristic who died</td>
<td>No with characteristic who survived</td>
<td>Observations</td>
</tr>
<tr>
<td>------------------------</td>
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<td></td>
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<td>Or median (IQR) if continuous among those who died (n=18)</td>
<td>Or median (IQR) if continuous among those who survived (n = 66)</td>
<td></td>
</tr>
<tr>
<td>Prolonged labour</td>
<td>27 (32)</td>
<td>11(61)</td>
<td>18 (27)</td>
<td>Chi – square P value 0.007</td>
</tr>
<tr>
<td>PROM</td>
<td>23 (27)</td>
<td>16 (89)</td>
<td>17(26)</td>
<td>Chi – square P value &lt;0.001</td>
</tr>
<tr>
<td>Degree of stain</td>
<td>Median 3.5</td>
<td>Median 3</td>
<td>Median 3</td>
<td>NS</td>
</tr>
<tr>
<td>Sign of fetal distress</td>
<td>15 (18)</td>
<td>1 (6)</td>
<td>14 (21)</td>
<td>NS</td>
</tr>
<tr>
<td>Prolonged 2nd stage</td>
<td>32 (38)</td>
<td>5 (27)</td>
<td>27 (40)</td>
<td>NS</td>
</tr>
<tr>
<td>c/section</td>
<td>20 (24)</td>
<td>3 (17)</td>
<td>17 (26)</td>
<td>NS</td>
</tr>
<tr>
<td>Cord around neck</td>
<td>20 (24)</td>
<td>5 (28)</td>
<td>15 (23)</td>
<td>NS</td>
</tr>
<tr>
<td>Apgar score (0–3)</td>
<td>Median 1</td>
<td>Median 2</td>
<td>Median 2</td>
<td>NS</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Total with characteristic (if categorical)</td>
<td>No characteristic who died</td>
<td>No with characteristics who survived</td>
<td>Observations</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------</td>
<td>---------------------------</td>
<td>-------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Male</td>
<td>54 (64)</td>
<td>12 (67)</td>
<td>42 (64)</td>
<td>NS</td>
</tr>
<tr>
<td>Bt weight</td>
<td>Median 4 ICR 3–4</td>
<td>Median 3.5 IQR 3–4</td>
<td>Median 4 IQR 4</td>
<td>NS</td>
</tr>
<tr>
<td>Resus/measure</td>
<td>3 intubated</td>
<td>2 intubated</td>
<td>1 intubated</td>
<td>NS</td>
</tr>
<tr>
<td>Consult to paeds team</td>
<td>20 (24)</td>
<td>2 (11)</td>
<td>18 (27)</td>
<td>NS</td>
</tr>
<tr>
<td>Lenght of stay</td>
<td>Median 2</td>
<td>Median 1</td>
<td>Median 2</td>
<td>NS</td>
</tr>
</tbody>
</table>
SUMMARY

- Birth asphyxia makes up 10% of all SCN admissions
- Incidence 33/1000 births
- Still birth rate 24/1000 births
- Mortality from birth asphyxia 18/84 = 21%
- Risk factors – prolonged labour, PROM and severe anaemia/transfused
- Only 62% had a 5 minute Apgar score recorded
- Foetal heart rate monitored but rarely recorded as abnormal

- Further multi-variable analysis of risk factors in DCH thesis
- Limited by small sample size
DISCUSSION

Incidence
33/1000 – this study
80.5/1000 – Ellis et al (Cameroon Study)

- High incidence of birth asphyxia

Mortality rate
21/1000 – this study
Globally – 23%
Western Pacific region – 14%
NDOH – 16%
POM GEN – 31%

- The mortality rate of BA continues to be high

Risk factors
1 Severe anaemia/Transfusion
– Ekta al Dalal, India, 2008

2. PROM
– Owsyn G et al, 2000, PNG
– Ellis et al, 2013, Cameroon

3. Prolonged Labour
– Ellis at al, 2013 Cameroon

OTHERS – risk factors not identified
primiparity, maternal fever, Multiple births

- Small sample size
- Missing charts
- Missing data – retrospective
CONCLUSION

- Risk factors for death from birth asphyxia:
  1. Severe anaemia/transfusion
  2. PROM
  3. Prolonged labour
1. In House Training
   - Understanding/Identifying risk factors for death from BA
   - Quality care and monitoring a pregnant women antenatally, peripartum, postpartum
   - Importance of recording 5 and 10 minute apgar scores

2. Essential Early Newborn Care be conducted (neonatal resuscitation)

3. At Risk Attendance by paediatric team for resuscitation and stabilisation

4. Develop a standard definition of birth asphyxia be used in admission book
ACKNOWLEDGEMENT

- Proffessor Trevor Duke
- Dr. Stanley Hanap
- Dr. Tarsicius Uluk
- Medical records personal – SPH
- Paediatric team – Sandaun Provincial
REFERENCES

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THANKYOU