Severe Pneumonia in Children at Sir Joseph Nombri Memorial Kundiawa General Hospital: a retrospective study

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Diploma in Child Health Project
Introduction

• Pneumonia – the leading killer of children < 5 years of age. (UNICEF/WHO Pneumonia.2006)

• Worldwide – >2million children die each year (UNICEF/WHO Pneumonia.2006)

• PNG – commonest cause for admission (30%) with a CFR of 5.2% (PNG Department of Health child morbidity & mortality -2013)
• Case Management Strategy – WHO, early 1980s
  - Theodoratou et al (2010) – CCM of pneumonia ↓ 70%
  - Sazawal et al (2003) – CCM of pneumonia ↓ 36%
  - Difficult to quantify hospital case management.

• PNG adapted – National & IMCI guidelines.

• Pneumonia remains – top cause of admissions to major hospitals with a high case fatality rate.
Aim
To describe the management of severe pneumonia in affected children admitted to Sir Joseph Nombri Memorial, Kundiaawa General Hospital (SJNM KGH).
Objectives

To describe

1. The cases that were diagnosed.
2. The course of anti-biotic treatment.
3. The detection of hypoxia and oxygen therapy.
4. The duration of hospital stay.
5. The complications encountered.
6. Ultimate outcome.
Method

• Study design - Retrospective Descriptive study

Study Criteria

Inclusion

• Age: 2 months – 59 months.

• Severe pneumonia. National classification (WHO - very Severe ). Hypoxia - SPO2 <90% and hepatomegaly of >2cm below the right costal margins.

Exclusion

• Age <2 months or >59 months.

• Children with AIDS, CHD, syndromic, severely malnourished and severe anaemic are not included.

• Severe diarrhoea with acidotic breathing without any chest signs

• Moderate pneumonia.
<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Recorded as Severe Pneumonia</td>
<td>108</td>
<td>114</td>
<td>222</td>
</tr>
<tr>
<td>Available from Medical Records Department</td>
<td>63</td>
<td>89</td>
<td>152</td>
</tr>
<tr>
<td>Severe Pneumonia</td>
<td>43</td>
<td>78</td>
<td>88</td>
</tr>
<tr>
<td>*Excluded from study</td>
<td>15</td>
<td>32</td>
<td>47</td>
</tr>
<tr>
<td>Included in Study</td>
<td>28</td>
<td>46</td>
<td>74</td>
</tr>
</tbody>
</table>

*Figures abstracted from Pediatric ward Discharged Registry
• Standard Proforma

• Analysis – Excel 2010 and SPSS Version 19

• Ethical approval granted – SMHS research committee.
### Sex and Age

- **Table 1. Sex Distribution**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>37</td>
<td>50</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>50</td>
</tr>
<tr>
<td>N=74</td>
<td>74</td>
<td>100</td>
</tr>
</tbody>
</table>

- **Table 2. Age**

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 74</td>
<td>2</td>
<td>59</td>
<td>9.12</td>
<td>8.454</td>
</tr>
</tbody>
</table>
Immunization

- Figure 1.

![Pie chart showing immunization status]

- Immunization Status:
  - Unknown: 47.3%
  - Up to date: 32.4%
  - Delayed: 12.2%
  - Complete: 8.1%
Admission Route & Referral

• Figure 2

Point of Admission

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD</td>
<td>50</td>
</tr>
<tr>
<td>ED</td>
<td>16</td>
</tr>
<tr>
<td>Ward</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
</tr>
</tbody>
</table>

• Figure 3

Referrals

<table>
<thead>
<tr>
<th>Location</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>61</td>
</tr>
<tr>
<td>Rural Hospital</td>
<td>5</td>
</tr>
<tr>
<td>Health Centre</td>
<td>6</td>
</tr>
<tr>
<td>Sub Health Centre</td>
<td>1</td>
</tr>
<tr>
<td>Aid Post</td>
<td>1</td>
</tr>
</tbody>
</table>
Diagnosis on Admission

Table 3. Diagnosis on Admission

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Pneumonia</td>
<td>42</td>
<td>56.8</td>
</tr>
<tr>
<td>Moderate Pneumonia</td>
<td>14</td>
<td>18.9</td>
</tr>
<tr>
<td>Severe PNA in HF</td>
<td>7</td>
<td>9.5</td>
</tr>
<tr>
<td>Severe PNA + Bacterial infection</td>
<td>4</td>
<td>5.4</td>
</tr>
<tr>
<td>Severe Bronchiolitis</td>
<td>5</td>
<td>6.8</td>
</tr>
<tr>
<td>Moderate Pneumonia + Bacterial Infection</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Moderate Bronchiolitis</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>74</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Detection of Hypoxia

• Table 4.

<table>
<thead>
<tr>
<th>Method</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Oximetry</td>
<td>54</td>
<td>73</td>
</tr>
<tr>
<td>Clinical</td>
<td>10</td>
<td>13.5</td>
</tr>
<tr>
<td>Not done</td>
<td>10</td>
<td>13.5</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>

• Figure 4.

Method to detect hypoxia

- Oximetry: 73%
- Clinical: 13.50%
- Not done: 13.50%
Hypoxia detection by Pulse Oximetry (n=54)

- On admission – 21/27
- Within 24 hours – 11/21
- Within 48 hours – 1/6

Hypoxia present – 61%
Oxygen

- 60 patients received oxygen therapy - 81%

- Table 5. Time to commence oxygen therapy

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen commencement time</td>
<td>.1</td>
<td>48.0</td>
<td>9.273</td>
<td>16.54</td>
</tr>
<tr>
<td>N=60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Antibiotic

• Figure 5.

AB on admission

- Ceftriaxone: 1
- CMP/Flucloxacillin: 1
- CMP/Gentamycin: 1
- Ceft/Gent/Flux: 2
- Ceft/Gent: 3
- X-pen/CMP: 1
- X-pen/Gent/Flux: 12
- Chloramphenical: 12
- X-pen/Flux: 1
- X-pen/Gent: 28
- X-pen: 11
- Erythromycin: 1

AB on admission
Complications

- Figure 6

None: 89.20%
Pneumothorax: 2.70%
Atelectasis: 2.70%
Meningitis: 1.40%
Sepsis: 1.40%
Effusion/Empyema: 1.40%
Epiglottitis/Sepsis: 1.40%
Length of Hospital stay

N = 74

• Minimum – 1
• Maximum – 20
• Mean – 6.10
• SD – 4.23
Ultimate Outcome

- Figure 7.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharged Home</td>
<td>89.2%</td>
</tr>
<tr>
<td>Died</td>
<td>6.8%</td>
</tr>
<tr>
<td>Absconded</td>
<td>4.1%</td>
</tr>
</tbody>
</table>
Discussion

• More children under 12 months old

• Nearly half (47.3%) have unknown immunization status

• 17.7% were referrals from peripheral clinics.
• Pulse Oximetry use in screening of hypoxia – 73%

• High prevalence of hypoxaemia – 61%

• Oxygen commencement time – Mean time (hrs) – 9.2 hours

• Commonest anti-biotic – Combination Benzyl Penicillin/ Gentamycin

• <10% developed complications

• Nearly 90% discharged home
Conclusion

• SJNM – KGH practices standard case management in their approach to patients presenting with severe pneumonia.

• High CFR (6.7)
Limitations

- Missing/unavailable charts
- Poor hospital recording system
- Small study sample
Recommendations

1. Data management systems: proper in-hospital system and curriculum for medical ward clerks.
2. Oxygen concentrators – proper monitoring
3. Regular in-services/training for health workers in the public system.
4. Strengthen/Empower the Primary Health Care System in PNG.
Acknowledgement

- Dr Poka
- Dr Kiage
- Dr Pameh
- Dr Welch
- Prof. Vince
- Medical Record Department – SJNM KGH
- Pediatric Nursing Staff – SJNM KGH
- Fellow colleagues - especially Dr Thyna
- My Family
Reference


Thank you.