Prescription of cough remedies among children hospitalized with respiratory tract illness.

Dr Michuki Maina
Background

- Respiratory tract infections account for almost 20% of under 5 deaths.
- Cough tends to cause anxiety to caregivers and reduces the quality of life of the patients.
- Use of cough remedies which include; mucolytics, decongestants and antitussives is currently not recommended in children.
- Associated with serious adverse reactions including arrhythmias, behavioural disturbances, respiratory depression and even death.
Background

• Unwarranted adverse drug reactions may worsen the disease outcomes.

• Paucity of data on the use of cough medication among children in the region
Objectives

• To describe the commonly prescribed cough medications among children hospitalized with respiratory illnesses in four hospital surveys.
• Describe prescription patterns over time from the surveys
• Describe the signs and symptoms associated with cough prescriptions
Methods

Inclusion

• Children from 1 month to 12 years admitted with symptoms of cough or with a diagnosis of an upper or lower respiratory tract infection based on the ICD 10 criteria

Exclusion

Children with a diagnosis of allergy/allergic condition (Rhinitis, Dermatitis)

• We included data from 4 hospital surveys between 2002-2015
<table>
<thead>
<tr>
<th>Type of Medicine</th>
<th>Active Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antihistamines</td>
<td>Brompheniramine  Chlorpheniramine  Loratidine  Dexchlorpheniramine  Diphenhydramine  Doxylamine  Pheniramine  Promethazine  Triprolidine  Cetirizine</td>
</tr>
<tr>
<td>Antitussives</td>
<td>Codeine  Dextromethorphan  Dihydrocodeine  Pholcodine  Pentoxyverine</td>
</tr>
<tr>
<td>Mucolytics /Expectorants</td>
<td>Bromhexine  Guaiphenesin  Ambroxol  Ipecacuanha senega and ammonia</td>
</tr>
<tr>
<td>Decongestants</td>
<td>Phenylephrine  Pseudoephedrine  oxymetazoline  Ephedrine xylometazoline</td>
</tr>
<tr>
<td>Antipyretic Containing cough medication</td>
<td>Paracetamol</td>
</tr>
<tr>
<td>Bronchodilator containing medications</td>
<td>Salbutamol  Terbutaline  Fenoterol</td>
</tr>
</tbody>
</table>
Results

2002 survey

• Total sample of 383 children across 15 hospital included in the analysis with 155 cough medication prescriptions (40.5%)
• Median Age 12 months (5-28.25)
• Average length of hospital stay 3(2-5)
Cough Remedy Prescriptions

- Antihistamine
- Bronchodilators
- Decongestants
- Mucolytic
8 Hospital Survey

• Sep 2006 – April 2008
• Pre and Post Intervention Survey
• 2006 Pre Intervention  Sample size 2166 prescriptions 655 (30.2)
• 2008 Post intervention  sample size 2199 prescriptions 425(19.3)
Cough Remedy Prescriptions - 8 hospital Survey

![Graph showing numbers of prescriptions for different cough remedies across two surveys (2006 and 2008).]
Associated symptoms (Adjusted Odds Ratio)-
8 District hospital Study

- Bronchodilators/Mucolytics
  - Wheeze 10.96(8.86-13.59), Chest Indrawing 1.96(1.62-2.38), Crackles 2.38(1.99-2.86)

- Decongestants
  - Central cyanosis 4.82(1.36-13.26)

- Antihistamines
  - Central cyanosis 2.34(1.15-4.33), Grunting 1.12(0.83-1.50), Crackles 1.64(1.26-2.14)
## Associated symptoms (Adjusted Odds Ratio)

<table>
<thead>
<tr>
<th></th>
<th>Bronchodilator/Mucolytics</th>
<th>Decongestants</th>
<th>Antihistamines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>0.72 (0.59-0.90)</td>
<td>0.97 (0.45-2.41)</td>
<td>1.22 (0.87-1.74)</td>
</tr>
<tr>
<td>wheeze</td>
<td><strong>10.96 (8.86-13.59)</strong></td>
<td>1.33 (0.48-3.16)</td>
<td>1.29 (0.86-1.89)</td>
</tr>
<tr>
<td>Central cyanosis</td>
<td>0.22 (0.11-0.42)</td>
<td><strong>4.82 (1.36-13.26)</strong></td>
<td>2.34 (1.15-4.33)</td>
</tr>
<tr>
<td>Chest Indrawing</td>
<td><strong>1.96 (1.62-2.38)</strong></td>
<td>1.41 (0.64-3.09)</td>
<td>0.82 (0.61-1.10)</td>
</tr>
<tr>
<td>Grunting</td>
<td>0.86 (0.71-1.04)</td>
<td>1.67 (0.80-3.48)</td>
<td><strong>1.12 (0.83-1.50)</strong></td>
</tr>
<tr>
<td>Crackles</td>
<td><strong>2.38 (1.99-2.86)</strong></td>
<td>1.07 (0.52-2.18)</td>
<td><strong>1.64 (1.26-2.14)</strong></td>
</tr>
</tbody>
</table>
Sircle Survey

- July 2012
- Total sample of 891 children across 22 hospitals included in the analysis with 85 cough medication prescriptions (9.5%)
- Median Age 14 months (8-27 months)
- Average length of hospital stay 3 days (2-6)
Clinical information Network

(Sept 2013 - Nov 2015)

- Total sample of 28369 children across 14 hospitals included in the analysis with 1095 cough medication prescriptions (3.9%)
- Median Age 15 months (7-27 months)
- Average length of hospital stay 3 (2-5)
Results-CIN
CIN Drugs

![Bar chart showing the distribution of CIN Drugs by type: Anthistamines, Antipyretics, Bronchodilator, Mucolytics. Anthistamines have the highest numbers, followed by Antipyretics, Bronchodilator, and Mucolytics.]
Associated symptoms CIN( Adjusted Odds Ratios)

• Bronchodilators/Mucolytics
  • Fever 2.16(1.23-4.15)
  • Chest Indrawing 2.26(1.44-3.54)
  • Crackles 2.18(1.41-3.39)

• Antihistamines
  Wheeze 1.52(1.19-1.92)
  Chest Indrawing 1.41(1.19-1.66)
### Associated symptoms CIN( Adjusted Odds Ratios)

<table>
<thead>
<tr>
<th></th>
<th>Bronchodilator and mucolytics</th>
<th>Decongestants</th>
<th>Antihistamines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>2.16(1.23-4.15)</td>
<td>1.46(0.38-9.50)</td>
<td>1.06(0.90-1.26)</td>
</tr>
<tr>
<td>wheeze</td>
<td>1.16(0.57-2.12)</td>
<td>1.91(0.10-11.56)</td>
<td><strong>1.52(1.19-1.92)</strong></td>
</tr>
<tr>
<td>Stridor</td>
<td>1.00(0.24-2.74)</td>
<td>NA</td>
<td>1.17(0.76-1.72)</td>
</tr>
<tr>
<td>Central cyanosis</td>
<td>1.31(0.07-6.11)</td>
<td>NA</td>
<td>0.46(0.11-1.23)</td>
</tr>
<tr>
<td>Chest Indrawing</td>
<td><strong>2.26(1.44-3.54)</strong></td>
<td>0.32(0.04-1.45)</td>
<td><strong>1.41(1.19-1.66)</strong></td>
</tr>
<tr>
<td>Grunting</td>
<td>0.34(0.16-0.65)</td>
<td>NA</td>
<td>0.82(0.65-1.02)</td>
</tr>
<tr>
<td>Crackles</td>
<td><strong>2.18(1.41-3.39)</strong></td>
<td>3.02(0.70-10.74)</td>
<td>1.12(0.94-1.33)</td>
</tr>
</tbody>
</table>
### Results

<table>
<thead>
<tr>
<th>Survey (Number of Hospitals)</th>
<th>2002 Hospital Survey (15)</th>
<th>8 District Hospital Survey (Pre intervention)</th>
<th>8 District Hospital Survey(Post Intervention)</th>
<th>Sircle Survey (22)</th>
<th>Clinical Information Network (14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>383</td>
<td>2166</td>
<td>2199</td>
<td>891</td>
<td>28369</td>
</tr>
<tr>
<td>Cough syrup Prescriptions (%)</td>
<td>155 (40.47)</td>
<td>655 (30.2)</td>
<td>425 (19.3)</td>
<td>85 (9.5)</td>
<td>1095 (3.9)</td>
</tr>
<tr>
<td>Median Age in Months (IQR)</td>
<td>12 (5-28.25)</td>
<td>12 (6-27)</td>
<td>12 (6-24)</td>
<td>14 (8-27)</td>
<td>15 (7-27)</td>
</tr>
<tr>
<td>Average Length of Stay Days (IQR)</td>
<td>3 (2-5)</td>
<td>3 (2-6)</td>
<td>3 (2-5)</td>
<td>3 (2-6)</td>
<td>3 (2-5)</td>
</tr>
</tbody>
</table>
Emerging Trends

Percentage with cough syrup

Year


IMCI ETAT + MoH
Summary

• General decline in the prescription of cough mixtures
• Most prescribed are oral bronchodilators and antihistamines

Moving Forward

• Data lacking for outpatient and Over the counter (OTC) prescriptions
• Health education - Clinicians and Caregivers
Clinical Information Network contributors include:
Morris Ogero; Thomas Julius; Boniface Makone; Mercy Chepkirui; Wycliffe Nyachiro & James Wafula (KEMRI-Wellcome Trust Research Programme); Samuel N’gar N’gar (Vihiga County Hospital), Nick Aduro (Kakamega County Hospital), Loice Mutai & David Kimutai (Mbagathi County Hospital), Caren Emadau, Cecilia Mutiso & Celia Muturi (Mama Lucy Kibaki County Hospital), Charles Nzioki (Machakos County Hospital), Francis Kanyingi & Agnes Mithamo (Nyeri County Hospital), Margaret Kuria (Kisumu East County Hospital), Sam Otido & Anne Kamunya (Embu County Hospital), Alice Kariuki (Karatina County Hospital), Peris Njiiri (Kerugoya County Hospital), Rachel Inginia & Melab Musabi (Kitale County Hospital), Barnabas Kigen (Busia County Hospital), Grace Ochieng & Lydia Thuranira (Kiambu County Hospital). Rachel Nyamai (Ministry of Health). David Githanga & Fred Were (Kenya Paediatric Association).