EFFECT OF ZINC SUPPLEMENTATION AS A TREATMENT OF PNEUMONIA IN CHILDREN: SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

Febrina Elisabeth¹, Defry Lesmana², Humaira Anggie Nauli², Widya Asih Lestari², Rahma Listyandini²

¹University of North Sumatera, Medan, Indonesia
²University of Indonesia, Depok, Indonesia
Pneumonia is the leading cause of pediatric morbidity and mortality around the world, kills more than 1.5 million children under 5 every year.

Zinc deficiency is responsible for 406,000 pneumonia related deaths of children under 5 years old.

A recent study in Uganda stated that zinc supplementation in children decrease case fatality of pneumonia significantly.

Other study in Nepal stated that daily zinc supplementation in treatment of severe pneumonia did not show a statistically significant reduction in hospital stay for children between 2 months to 5 year of age.

70 mg of weekly zinc supplementation success in reduce pneumonia and mortality in children aged < 2 years of age in Bangladesh.

The present study was undertaken to review the effectiveness of zinc supplementation in the treatment of pneumonia in children.
OBJECTIVE

to review the effectiveness of zinc supplementation in the treatment of pneumonia in children
METHOD

• The methods of this systematic review refers to PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) statement of healthcare intervention.

• Eligibility criteria for inclusion in this systematic review according to PICOS (Population, Intervention, Comparison, Outcome, and Study design).

• We exclude studies of pneumonia in adults; non-randomized and non-controlled for RCT; and no exposure for observational studies. Primary outcome measure was the effectiveness of zinc supplementation in reducing mortality, time to normalization, or case fatality among pneumonia infected children.
DATA COLLECTION AND MANAGEMENT

1. Articles through database searching (N=135)
2. Articles through manual searching (N=0)

Records after duplicates removed (N=77)

Records screened (N=52)

Records Excluded (N=25)

Studies included in qualitative synthesis (N=8)

Full-text articles assessed for eligibility (N=27)

Full-text articles excluded with reasons (N=19)
- 9 adults participants
- 1 observational
- 4 systematic review
- 5 HIV infected

Figure 1. PRISMA flow diagram illustrating literature search and evaluation
<table>
<thead>
<tr>
<th>Country</th>
<th>Age</th>
<th>Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>2-12 months</td>
<td>Zinc (70 mg) weekly; placebo</td>
<td>Significantly fewer incidents of pneumonia in the zinc group than the control group</td>
</tr>
<tr>
<td>India</td>
<td>6-30 months</td>
<td>Zinc (10 mg) daily for infants &amp; Vit. A (100 000 IU); placebo</td>
<td>Zinc supplementation substantially reduced the incidence of pneumonia in children who had received vitamin A</td>
</tr>
<tr>
<td>Nepal</td>
<td>2-35 months</td>
<td>Zinc (10 mg/d) for 2-11 mo Zinc (20 mg/d for 12 mo of age)</td>
<td>Did not prevent respiratory illness over the next 6 mo</td>
</tr>
<tr>
<td>Iran</td>
<td>3-60 months</td>
<td>Zinc sulfate (2 mg/kg/d, max 20 mg in 2 divided doses, for 5 days); placebo</td>
<td>Zn accelerates recovery from severe pneumonia</td>
</tr>
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<td>Country</td>
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<td>Intervention</td>
<td>Outcome</td>
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<tr>
<td>India</td>
<td>2 – 60 months</td>
<td>Elemental Zinc (20 mg/5 ml; in a dose of 10 mg i.e., 2.5 ml for children up to 1 year or 20 mg i.e., 5 ml for children &gt;1 year of age); placebo</td>
<td>Addition of zinc does not improve symptom duration or cure rate in acute bacterial pneumonia in under-five children</td>
</tr>
<tr>
<td>Nepal</td>
<td>2 – 60 months</td>
<td>Zinc Sulfate (10mg); placebo</td>
<td>Does not help in short term clinical recovery from severe pneumonia</td>
</tr>
<tr>
<td>Uganda</td>
<td>6 – 59 months</td>
<td>Zinc (20 mg for children ≥ 12 months, and 10 mg for those &lt; 12 months); placebo</td>
<td>Has no significant effect</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>2 – 23 months</td>
<td>Zinc (20 mg/day); placebo</td>
<td>Accelerates recovery from severe pneumonia</td>
</tr>
</tbody>
</table>
To conclude, present data do not support therapeutic zinc supplementation in the management of under-five children with acute pneumonia. Future trials should focus on the limitations/weakness identified in the present systematic review so that better quality evidence can be generated.