Structured Clinical Question: In a patient with bronchiolitis, is nebulised adrenaline effective in reducing their length of stay?

Scenario: We see a lot of children with bronchiolitis in the emergency department. The majority of them have mild to moderate respiratory symptoms, are managing to feed, but still get admitted because of mild respiratory distress. This literature search is to find out if adrenaline is useful in these children in reducing their length of stay.

Methods: Medline and Embase were searched using the words epinephrine or adrenaline and combined with the word bronchiolitis. The search was done both with and without thesaurus mapping, the search was limited to human, English language and children between 0-23 months in Medline and children up to 6 years of age in Embase. 73 studies were found in Medline, 58 studies were found in Embase, among which 18 were found to be suitable. 7 randomised controlled trials were about the use of adrenaline in emergency department, combination treatment were not included.

Commentary: Bronchiolitis is one of the most common reason for admission to paediatric wards. Most patients require hospital admission for one or two days. Every possible action should be taken to reduce these hospital admissions. At the same time, patients should get better.

2 other searches have been done on this same subject, one done by Hartling et al (3), published in 2003 and 2004. They concluded that there was insufficient evidence for the use of epinephrine among in-patients and they called for large, multi-centre trials to evaluate the use of adrenaline in an outpatient settings. The search was updated in 2011, (2) which found that adrenaline was superior in providing short term outcome for out-patients and called for more research to confirm the benefits of combined gluco corticoids and adrenaline treatment. The second search was done by Maud Meates in 2002 (1). According to her publication, nebulised adrenaline is safe, effective in controlling symptoms and it reduces hospital admissions.

Results of this literature search: There are discrepancies in the results. A large multicentre trial (8) found less successful discharges in the epinephrine group, although many other randomised controlled trials showed that adrenaline gives short term clinical improvement and also it aids early discharges, and some of these results are not statistically significant (Table 1). Further large, multi centred trials are needed to evaluate this further.

Clinical bottom line: There is insufficient evidence to justify the use of adrenaline in bronchiolitis at the moment.

Table 1

<table>
<thead>
<tr>
<th>Citation</th>
<th>Study group</th>
<th>Methods</th>
<th>Outcome</th>
<th>Key results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simsek-Kiper et al, 2011</td>
<td>75 patients were selected 2-24 months of age with first episode of wheeze, NPA sample sent for virology</td>
<td>Randomised controlled trial: Patients received either nebulised epinephrine (2.5mg) or salbutamol (0.15mg/kg/dose)</td>
<td>Clinical improvement, hospitalisation and relapse rates are noted</td>
<td>Hospitalisation rates and relapse higher in the Epinephrine group, no difference between salbutamol and epinephrine with regards to clinical improvement</td>
<td>Some results are not statistically significant</td>
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<tr>
<td>Study</td>
<td>Patients</td>
<td>Age Range</td>
<td>Clinical Diagnosis</td>
<td>Study Design</td>
<td>Intervention</td>
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<tr>
<td>Walsh et al 2008</td>
<td>703</td>
<td>&lt;18 months</td>
<td>Bronchiolitis</td>
<td>Multicentred double blind randomised controlled trial</td>
<td>Racemic albuterol (&gt;5kg: 1.25mg, &lt;5kg: 0.625mg) or one dose of racemic epinephrine (11.25mg) plus 2 saline nebulisers</td>
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<tr>
<td>Mull et al 2004</td>
<td>66</td>
<td>0-12 months</td>
<td>New onset of wheeze</td>
<td>Randomised controlled trial, double blind - patients received either adrenaline (0.9mg/kg of 2.25% racemic epinephrine) or albuterol (0.15mg/kg of 0.5%) nebuliser</td>
<td>Respiratory parameters, hospitalisation, discharges and relapse rates</td>
</tr>
<tr>
<td>Hari Prakash et al 2003</td>
<td>75</td>
<td>1 month to 1 year</td>
<td>Bronchiolitis</td>
<td>Randomised controlled trial, double blind - patients received either nebulised adrenaline (2ml of 1:1000) or 2 doses of 5ml nebulised saline</td>
<td>Admission to the hospital and changes in the respiratory parameters were noted</td>
</tr>
<tr>
<td>Ray MS and Singh V 2002</td>
<td>91</td>
<td>2 months to 2 years</td>
<td>Wheeze</td>
<td>Randomised controlled trial, patients received adrenaline (0.1mg/kg of 1:10,000ml) 3 doses or 3 doses of salbutamol (0.1mg/kg/dose)</td>
<td>Respiratory parameters were noted</td>
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<tr>
<td>Reijonen et al 1995</td>
<td>100</td>
<td>&lt;24 months</td>
<td>Acute Bronchiolitis</td>
<td>Randomised, double blind controlled trial - patients were divided into 4 groups - 1. One group received epinephrine followed by normal saline, second group the vice versa, third group received albuterol followed by normal saline and vice versa</td>
<td>Respiratory parameters were noted</td>
</tr>
<tr>
<td>Menon et al 1995</td>
<td>Double blind randomised controlled trial, patients received either nebulised salbutamol or epinephrine (3mg)</td>
<td>Respiratory parameters and hospitalisation rate were noted</td>
<td>More number of patients in the salbutamol group were admitted when compared to adrenaline</td>
<td>Unable to get the full article</td>
<td></td>
</tr>
</tbody>
</table>
References:

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