



Viral bronchiolitis management in hospitals in the UK

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ABSTRACT

Background: Viral bronchiolitis is the leading cause of hospitalisation in infants less than a year old. The United Kingdom (UK) National Institute for Health and Care Excellence (NICE) published a guideline for the management of viral bronchiolitis in June 2015.

Objectives: This study aimed to prospectively survey the management of viral bronchiolitis in hospital Trusts in the UK to provide a baseline of practice prior to the publication of the 2015 NICE bronchiolitis guideline against which future practice can be assessed.

Study design: An electronic, structured questionnaire was sent to hospital paediatricians in the UK prior to the publication of the NICE bronchiolitis guideline via the Royal College of Paediatrics and Child Health e-portfolio system to assess the quality of Trust's viral bronchiolitis management guidelines.

Results: Paediatricians from 111 (65% of all) UK Trusts completed an electronic questionnaire. 91% of Trusts had a bronchiolitis guideline. Overall only 18% of Trusts would be fully compliant with the NICE guideline. Between 43–100% of Trusts would be compliant with different sections of the guideline. There was variation in hospital admission criteria with respect to the need for supplemental oxygen (oxygen saturations < 88% to < 95%). 'Unnecessary' medications (especially bronchodilators, nebulised hypertonic saline and antibiotics) and investigations (chest x-ray and blood gas) were regularly advised. 72% of Trusts advised respiratory virus testing in all hospitalised infants and 64% created bronchiolitis bays to cohort infants.

Conclusions: There was wide variation in the management of infants with bronchiolitis in Trusts. Most bronchiolitic infants are not managed optimally in hospitals. Future guidelines should include advice on virus testing and isolation/cohorting.

1. Background

In developed countries, viral bronchiolitis, in particular that caused by respiratory syncytial virus (RSV), is the leading cause of hospitalisation in infants less than a year old [1]. More than 30,000 infants are hospitalised each year in England and Wales due to viral bronchiolitis with a wide variation in rates of hospitalisation in different geographical regions of the United Kingdom (UK) [2–4]. In one study hospitalisation rates varied between 351 and 5140 per 100 000 in English Primary Care Trusts [3]. No clear cause has been identified for the wide variation although differences in hospital management protocols and admission guidelines may have a role [3].

As currently there are no treatments for viral bronchiolitis the management is purely supportive (oxygen supplementation and feeding support). There is evidence that medications including bronchodilators, steroids, nebulised adrenaline, hypertonic saline, leukotriene receptor

antagonists (e.g. montelukast) and antibiotics and physiotherapy have no role in the vast majority of hospitalised bronchiolitic infants [5–11] despite them often being used.

In Scotland, the Scottish Intercollegiate Guideline Network (SIGN) published a guideline for managing infants with viral bronchiolitis in 2006 (withdrawn December 2015) [12] but in England and Wales there was no national guideline for the management of viral bronchiolitis for hospital doctors until the National Institute for Health and Care Excellence (NICE) published their guidance in June 2015 [13]. The guidance given by NICE and SIGN are almost identical in terms of hospital management. NICE recommendations [13] include:

- Give supplemental oxygen if saturations < 92% in air (< 94% in SIGN)
- Do not routinely prescribe bronchodilators, nebulised adrenaline, steroids, nebulised hypertonic saline, antibiotics, leukotriene

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receptor antagonists or ribavirin

- Do not routinely perform physiotherapy
- Do not routinely perform chest x-rays or blood gases
- Provide written information for parents

Individual hospitals and NHS Trusts have local guidelines often based on national (SIGN) or international (American Academy of Pediatrics [AAP]) guidelines but how variable these guidelines are in the UK National Health Service (NHS) is unknown.

2. Objectives

The primary aim of this study was to prospectively survey hospital Trusts in the UK (England, Scotland, Wales and Northern Ireland) to provide a baseline of practice prior to the publication of the 2015 NICE bronchiolitis guideline against which future practice can be assessed. Anecdotal reports suggest respiratory virus testing and isolation/cohorting of infants with viral bronchiolitis happens in many NHS Trusts but currently there is not clear UK guidance on when to test for respiratory viruses or isolate/cohort bronchiolitis infants. A secondary aim, therefore, was to assess the use of respiratory virus testing and isolation/cohorting of infants with viral bronchiolitis in hospital Trusts.

3. Study design

In March 2015 an electronic, structured questionnaire (Appendix A) was sent to paediatricians covering all healthcare Trusts in England, Wales, Scotland and Northern Ireland that provide paediatric care ($n = 170$). Hereafter these will all be referred to as “Trusts”. The questionnaire was based on the NICE bronchiolitis draft guideline, and included questions on Trust guidelines for the management of viral bronchiolitis. Questions on cohorting of infants with viral bronchiolitis and viral testing were also included. Trust guidelines (which cover all hospitals within a Trust) are written and developed by clinicians (e.g. paediatricians) and usually reviewed and ratified by Trust guideline development committees which involve all appropriate stakeholders (e.g. clinicians, pharmacy, laboratory staff, etc). Questionnaires were sent to paediatric consultants and trainees via the Royal College of Paediatrics and Child Health (RCPCH) e-portfolio system (which includes all paediatric trainees and most paediatric consultants in the UK) and followed up with targeted emails in April and May 2015 with a link to the questionnaire sent to paediatricians (consultants and trainees) working in those Trusts that had not responded initially. The survey closed at the end of May 2015. We also asked paediatricians to send an electronic copy of their Trust’s bronchiolitis guideline if they had one. If we had more than one response from a Trust and there was variation in the questionnaire answers from the Trust, then we included the responses that suggested the broadest number of infants were included for the question asked. If we also had an electronic copy of the guideline we completed the questionnaire using the information it contained.

Data were analysed for descriptive statistics using Microsoft Excel version 16 (2016).

As per the UK National Health Service (NHS) Health Research Authority guidance, formal ethical approval was not required for this study.

4. Results

Questionnaires were sent to doctors covering all 170 Trusts routinely caring for children in England, Scotland, Wales and Northern Ireland (NI). We received responses from 111 (65%) Trusts; 104 (66% of English and Scottish Trusts) in England ($n = 96$) and Scotland ($n = 8$), five (71% of Welsh Trusts) in Wales and two (40% of NI Trusts) in NI. We received one response from 69 Trusts, two responses from 21 Trusts, three responses from 13 Trusts, four responses from five Trusts and from each of three Trusts we received five, six and eight responses

respectively. Twenty-four (22%) respondents sent an electronic copy of their Trust’s bronchiolitis guideline enabling corroboration of their responses with the guideline, seven (6%) of these were from Trusts where we received more than one response. For each of the other Trusts where there were multiple responses there were minor variations in the responses from each respondent.

4.1. Written guidelines

One hundred (91% of all) Trusts had a written guideline for the management of infants with viral bronchiolitis. Of those 100, ninety-one (91%) Trusts had a local guideline, eight (8%) used a national guideline (SIGN) and one (1%) used the American Academy of Pediatrics guideline.

4.2. Investigations and interventions

4.2.1. Blood gas

Of the 100 Trusts that had a guideline, 84 (84%) suggested only carrying out a blood gas in hospitalised infants with severe bronchiolitis (i.e. requiring high dependency or intensive care) (in line with SIGN/NICE guidance), four (4%) Trusts in all hospitalised infants with viral bronchiolitis, in four (4%) Trusts the guideline advised not to do a blood gas routinely (also in line with SIGN/NICE guidance) and in eight (8%) Trusts the guideline did not mention blood gas testing.

4.2.2. Chest x-ray

Sixty-five (65%) Trust guidelines suggested performing a chest x-ray in hospitalised infants with severe viral bronchiolitis (i.e. requiring high dependency or intensive care) (in line with SIGN/NICE guidance), 22 (22%) Trusts advised not to perform chest X-rays routinely (also in line with SIGN/NICE guidance), ten (10%) Trusts’ guidelines did not mention chest x-rays and two (2%) Trusts advised chest x-rays for all hospitalised infants with viral bronchiolitis.

4.2.3. Oxygen saturations

The level of oxygen saturations suggested as an indication to administer supplemental oxygen varied between Trusts from $< 88\%$ to $< 95\%$; one (1%) Trust $< 88\%$, four (4%) $< 90\%$, 58 (58%) $< 92\%$, 16 (16%) $< 93\%$, 17 (17%) $< 94\%$, one (1%) $< 95\%$ and three (3%) were outside this range.

4.2.4. Other interventions

The frequency of use of interventions used to manage infants with viral bronchiolitis varied considerably (Table 1). Of note, 55% of Trusts advised using nebulised hypertonic saline in some settings (10% were for “other indications”) (45% compliance with the NICE guideline) and 47% advised using bronchodilators in some settings (20% were for “other indications”) (53% compliance with the NICE guideline). The majority of Trusts (83%) advised using nasogastric feeds in all hospitalised infants (admitted to a ward or high dependency/intensive care) and intravenous fluids were reserved for those most severely unwell (77% Trust advised using in severe bronchiolitis requiring high dependency/intensive care).

4.3. Written advice

Fifty-one (47%) Trusts provided written guidance about viral bronchiolitis to parents of infants discharged from the emergency department (ED) and the paediatric wards (in line with SIGN/NICE guidance), 27 (25%) if discharged from the ward (and not if discharged from the ED), 18 (17%) if discharged from ED (and not if discharged from the inpatient ward), one respondent did not know if written advice was given, and 12 (13%) Trusts did not provide written advice to any parents.

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