

Pediatric respirology and hereditary disorders

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Chest X-ray in children hospitalized with bronchiolitis

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Background: Bronchiolitis guidelines do not recommend chest X-ray(CXR) in uncomplicated bronchiolitis, yet CXR is still frequently used. We aimed to evaluate the utilization of chest radiographs in children with bronchiolitis and RSV lower respiratory tract infection (LRTI). We aimed to estimate frequency CXR during 90 consecutive months (2010-17), and influence of CXR on patient's treatment (antibiotic treatment), as well as the relation with etiological factor, and length of hospital stay (LOS).

Material and methods: 581 patients with RSV (LRTI) and non-RSV bronchiolitis were included into the study. Finally, 459 patients were diagnosed with bronchiolitis (390 RSV and 69 non-RSV), 65 with RSV pneumonia, and 57 with RSV bronchiolitis.

Results: 166 (28.6%) patients had the CXR performed, including 19 (11.4%) CXRs in outpatient setting (prior to hospitalization). CXR's prognostic sensitivity and specificity in guiding antibiotic treatment was low, 78% and 58%, respectively. CXR positive prognostic value and negative prognostic value were also 78% and 58%, and number needed to diagnose (NND) was 2.777. Patients with performed CXR (irrespective of result) were at 22.9-fold higher risk of antibiotic therapy (95%CI: 14.1-37.1, p<0.01), while patients with positive CXR were only at 8-fold higher risk of antibiotic treatment (95CI: 4.6-16.4, p<0.01). Patients with CXR required longer LOS (10 vs 8 days, p<0.01), and, interestingly, frequency of CXR was much higher in patients with RSV bronchiolitis than in the non-RSV bronchiolitis group (61% vs 31%). In time analysis, percentage of CXR decreased from 78% 2010 to 33% in 2017, with the lowest value of 10% in 2015. Additional cost of CXR that did not influence on patient's treatment was 381 euro.

Conclusions: The frequency of CXR was too high. Highly increased risk of antibiotic in patients with CXR (and much less increased in case of positive CXR), higher percentage of CXR in RSV group (related in general to more severe disease course), and longer LOS show that CXR is generally performed in more severe patients. Nevertheless, recognizing practical impact of CXR use is crucial to omit unnecessary radiation.