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Title: Quantitative analysis of severe asthma exacerbation requiring continuous inhalation therapy by measurements of modified pulmonary index score

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Body: [Background] Acute exacerbation of asthma is qualitatively classified as mild, moderate or severe. In Japanese guideline for pediatric asthma, continuous inhalation therapy (CIT) with isoproterenol is recommended for severe asthma exacerbation, in addition to systemic steroids. [Aim] We wanted to quantitatively analyze the severe asthma attack requiring CIT by measuring modified pulmonary index score (MPIS; Carroll et al, Ann Allergy Asthma Immunol, 2005;94:355-359), in which 6 different categories were evaluated. Minimum and maximum scores in MPIS were 0 and 18, respectively. [Methods] The MPIS was measured in 87 asthmatic children hospitalized because of severe acute exacerbation (mean age: 5.0 yrs old). It was recorded on admission by physicians and, then, twice a day by nurses until discharge. In all subjects, systemic steroid was given, and, in some of them, CIT was started because of persistence of severe respiratory symptoms (n=30 ; CIT group). [Results] Inter-rater reliability of MPIS was high (physician to nurse; r=0.96, p<0.001). The MPIS on admission was significantly higher in CIT than in non-CIT group (10.5±0.4 and 8.2±0.3, respectively; p<0.01). It was found that a score of 10 on admission was a useful cutoff for CIT (sensitivity and specificity were 74% and 78%, respectively). The period until the MPIS decreased to lower than 3 (normal range) was significantly longer in CIT (4.0±0.4 days) than in non-CIT group (3.1±0.2 days, p<0.01). [Conclusion] Measurements of MPIS would be useful in determining the degree of treatment during asthma exacerbation.