

Virus infections in the exacerbation of asthma in children from a pediatric setting in Sri Lanka

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Acute exacerbation of asthma (AEA) is a potentially life-threatening condition, which is often precipitated by respiratory infections. Particularly in children, viral respiratory tract infections are a common cause of acute exacerbation of asthma. There are limited Sri Lankan data on the role of viruses in acute respiratory tract infections among children. However, there are no data related to the role of viral infections causing acute exacerbation of asthma in Sri Lankan children needing hospital admission. A case-control study was conducted at the university pediatric unit, North Colombo Teaching Hospital, Ragama, Sri Lanka. Children between 3-15 years, admitted with AEA were recruited for the study as cases, along with another 100 children with a history of asthma without exacerbation as controls. Each group consisted of 100 children. Sputum/throat swabs were tested for the presence of antigens to five common viruses causing upper respiratory tract infections namely, adenovirus, influenza A virus, influenza B virus, parainfluenza viruses (1-3), and respiratory syncytial virus using commercially available indirect immunofluorescence assay (D3 Ultra DFA Respiratory Virus Screening & ID Kit by The Diagnostic Hybrids, Inc, Athens, USA). This part of the study of collecting samples was done throughout the years 2019 and 2020. The mean age of cases was nine years and 9.5 years in the control group. There was no significant difference in the gender distribution between the two groups ($P>0.05$). Sputum samples were collected from 78% of the cases, and the rest had throat swabs. Only throat swabs were taken from the children in the control group. Immunofluorescence was used to identify respiratory viruses. In cases, adenovirus, influenza A virus, influenza B virus, parainfluenza viruses, and respiratory syncytial virus were detected at 9%, 1%, 2%, 5%, and 3% respectively; in the control group, it was 2%, 1%, 1%, 5%, and 2%. There was a significantly higher detection rate of adenovirus in the cases compared to the controls ($P = 0.040$), but no significant difference was noted for other viruses. Children admitted with acute exacerbation of asthma were having significantly high infection rates with adenovirus compared to control groups. Hence, adenovirus infections seem to be an important causative factor for AEA. Other viruses identified from both cases and controls in the order of frequency were parainfluenza virus, respiratory syncytial virus, influenza B virus, and influenza A virus.

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