

## Seroprevalence of Respiratory Syncytial Virus and Human Parainfluenzae Virus in Children with Respiratory Problems in Share-Kord, Central Iran

### Dear Editor,

Indeed, the leading causes of severe lower respiratory tract infection in infants and young children are Respiratory Syncytial Virus (RSV),<sup>1</sup> and Human Parainfluenza Virus (HPIV).<sup>2</sup> RSV is a major cause of respiratory infection in infants.<sup>3</sup> This infection mainly occurs in children less than two years old. During the RSV season, it is estimated that about 40% of children will develop a lower respiratory tract infection (LRTI).<sup>4</sup> Changes in airway immunity and/or integrity seem to play a role in the pathogenesis of this infection, as may be observed in vulnerable groups such as neonates, premature infants, and those with congenital or acquired immunodeficiencies or cardiac or respiratory conditions.<sup>5</sup> HPIV causes several serious respiratory diseases in children for whom there is no effective prevention or therapy. In addition to the common association of HPIV with croup and bronchiolitis, HPIV is associated with uncomplicated upper respiratory tract infections in adults, serious lower respiratory tract infections in infants, and non-respiratory tract infections in children and adults.<sup>6</sup> HPIV types 1, 2, and 3, cause the majority of childhood cases of croup, bronchiolitis, and pneumonia worldwide.<sup>7</sup> PIV3 alone is responsible for approximately 11% of pediatric respiratory hospitalizations in the US and is the predominant cause of croup in young infants.<sup>8</sup> There have been few reports of viral ARI due to these two viruses in Iran over the last years.<sup>9</sup> Therefore, this study aimed to determine the seroprevalence of HPIV and RSV in the children from a central city of Iran, Share-Kord.

This prospective and descriptive study was conducted on a total of 300 children who referred to Hajar Hospital of Share-Kord, Iran with acute upper and lower respiratory diseases from 2007 to 2008. They were aged 2-60 months and suffered mainly from pneumonia, pharyngitis, bronchiolitis and croup. The serum samples from the patients were tested for RSV and HPIV specific (IgM and IgG) antibodies using enzyme-linked immunosorbent assay (ELISA). The serum samples were tested for RSV- and HPI- specific antibodies using ELISA. A questionnaire includ-

ing questions about socio-demographic status, history of the disease, etc. was filled in. The data were analyzed by Fisher test, using SPSS software. The results were regarded significant when  $p < 0.05$ .

This prospective study was conducted using a total of 300 children who referred to Hajar Hospital of Share-Kord, Iran with acute upper and lower respiratory diseases from 2007 to 2008. The children were aged 2-59 months. Of them, 103 patients (34.3%) were female. Of the 300 serum samples tested for RSV-specific antibodies, 20 (6.7%) and 6 (2%) were positive for IgM and IgG specific antibodies, respectively. There was no significant relationship between IgM seroconversion and age and sex in the infants studied. However, there was a significant relationship between IgG positivity and sex in these children. Among the 20 IgM positives, 12 suffered from pneumonia, 1 from bronchiolitis, and 7 from Croup. There was no significant relationship between IgM seropositivity and the syndromes in these children.

Due to restrictions of reagent supply, ELISA for HPIV was carried out a few months later and unfortunately we missed about 100 of the serum samples. These children were aged 6 to 60 months. 77 of them (38.5%) were female. Of the 200 serum samples tested, 4 (2%) and 84 (42%) were positive for HPIV IgM- and IgG-specific antibodies, respectively. Three of the IgM positive cases suffered from pneumonia and 1 from croup with no significant relationship between IgM seroconversion and these syndromes. As those with RSV, there was no significant relationship between IgM seroconversion and age and sex, but the relationship between IgG positivity and sex in these children was significant.

In this study, we determined the seroprevalence of both RSV and HPIV in a group of children with respiratory diseases from a central city of Iran, Share-Kord over a period of approximately 6 months starting from 2007 to 2008. There is some evidence indicating that female children are more resistant to severe respiratory diseases than male ones,<sup>10</sup> with unknown reasons. In our study, also, the majority of the children were male and there was a significant statistical relationship between sex and IgG seroprevalence

which is consistent with the findings of these types of studies in other regions of Iran.<sup>9</sup> All of these results are in agreement with the suggestion that females are basically protected against RSV and HPIV hospitalization.<sup>11</sup> Based on our results, anti-RSV IgM prevalence was more than that of HPIV, whereas anti-HPIV IgG was more than that of RSV. It is likely that these children have been more sensitive to infection with the later virus. Other reports from Iran, in the case of RSV, are in agreement with our finding<sup>11</sup> with no reports for HPIV. However, obviously there is no evidence supporting these findings. In our study, using ELISA (and detection of IgM-specific antibody), RSV infection was found in 20 of 300 (6.7%) children. There is some evidence indicating relatively higher prevalence of RSV in children in other regions of Iran using direct fluorescent antibody (DFA).<sup>9</sup> This difference might be attributed to the high sensitivity of DFA test.<sup>12</sup> The high rate of RSV and HPIV isolates in infants in several countries<sup>8</sup> is not similar to those found in Iran. This shows the higher sensitivity of PCR than that of DFA<sup>12</sup> and ELISA.

We found that pneumonia was the most common clinical diagnosis among both anti-RSV and HPIV (IgM) positive patients followed by croup and bronchiolitis (in RSV infected infants) and croup (in HPIV infected ones). Our data are not consistent with those

indicating<sup>13</sup> that bronchiolitis was the most common clinical diagnosis, followed by pneumonia associated with RSV infection. Similar findings were reported by other investigators.<sup>10</sup> As both viruses cause a variety of respiratory syndromes in infants,<sup>14</sup> this difference does not seem to be so important. In conclusion, as there was no significant relationship between the clinical syndromes and IgM seroprevalence in the children studied, these two viruses might contribute to the occurrence of these syndromes.

**Keywords:** Parainfluenza virus; ELISA; Respiratory syncytial virus; Croup

**Conflict of interest:** None declared.

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