The impact of viral respiratory infections in the first year post-transplant period of pediatric hematopoietic stem cell transplant (HSCT) recipients.

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Background

Infection caused by respiratory viruses (RV) is a threat for hematopoietic stem cell transplant (HSCT) recipients. RVs in HSCT patients with respiratory syndromes should be strictly monitored in the pre-engraftment or early post-transplantation period and in patients with acute or chronic GVHD. Due to the high morbidity and mortality rates associated with RVs infections and the lack of directed antiviral therapy for most of these infections, prevention remains the mainstay for reducing their incidence and controlling transmission in HCT recipients. This retrospective study aimed to investigate the incidence and the duration of respiratory episodes caused by viruses in pediatric HSCT recipients.

Material/methods

Patients who underwent allogeneic or autologous HSCT at Pediatric Hematology–Oncology Unit, Fondazione IRCCS Policlinico San Matteo, Pavia from January 2010 to December 2014 were analyzed. Respiratory samples from patients with respiratory syndromes were routinely tested using a panel of RT-PCR and real-rime RT-PCR assays for 12 respiratory viruses within the first year post-transplant.

Results

One hundred eighty-six HSCT recipients including 158 (84.9%) allogenic (80 MUD, 56 PMFD, 21 MFD, and 1 sibling) and 28 (15.1%) autologous transplants were evaluated. In 118/186 (63.4%) patients at least one respiratory episode caused by viruses was identified, while 68/186 (36.6%) patients were negative (Figure 1). Among positive patients, 73/118 (61.9%) had a single viral respiratory episode, while 45/118 (38.1%) had multiple episodes (29 with 2 episodes, 8 with 3, 8 with 4 and 1 with 6) (Figure 1).

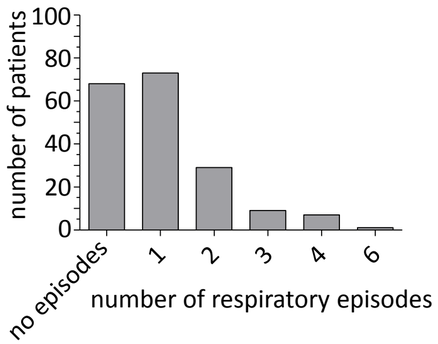

Fig.1 Frequency of viral respiratory episodes

A total of 192 viral episodes, including 174 (90.6%) single infections and 18 (9.4%) co-infections were observed (Figure 2). Among episodes sustained by a single virus, HRVs were the most prevalent viruses with 54.0% followed by respiratory syncytial virus (13.2%), human coronaviruses (9.2%), human parainfluenza viruses (8.0%), influenza A (6.3%), adenovirus (6.3%), and influenza B (2.9%).

In patients with multiple viral episodes, the first episode was observed significantly earlier (median 17.5 days; range 1-349 days) than patients experiencing a single viral episode (median 62 days; range 1-358 days; p=0.01) (Figure 3).

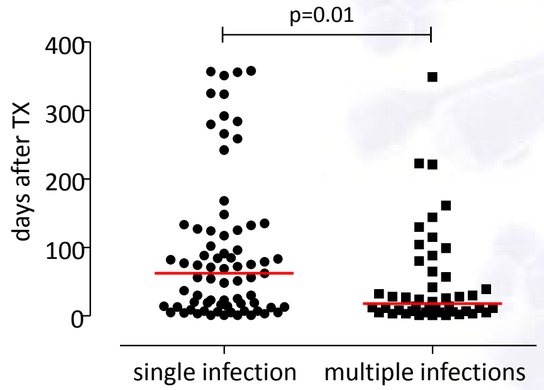

Fig 3. Day onset of first respiratory episode

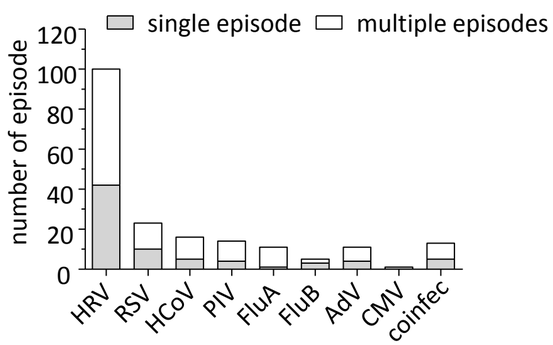

Fig 2. Distribution of respiratory viral episodes

Twenty-seven episodes (14.0% of total) of prolonged infections defined as viral shedding ≥30 days were observed**.** The median duration of viral shedding was 64 days (range 30–159 days). In 18/27 (66.6%) patients, the onset of infection occurred during the induction and before transplant engraftment (<30 days from TX). In these patients, the duration of viral episodes was higher than those observed in the remaining 9 patients, in which the onset of infections occurred after the engraftment (>30 days from TX) (p=0.02) (Figure 4).

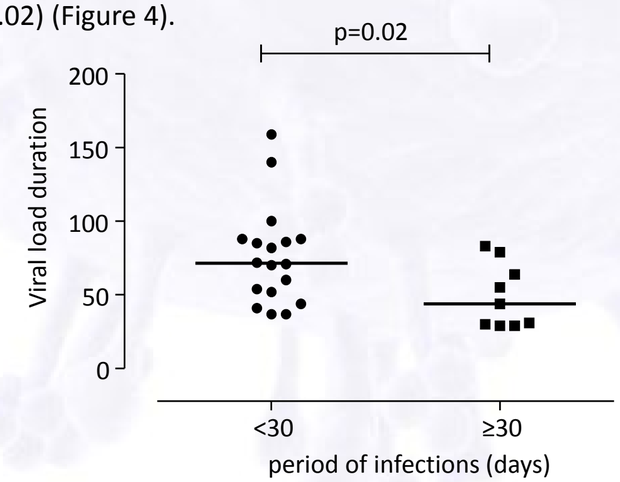

Fig 4. Prolonged respiratory episodes

Conclusions: Among pediatric HSCT recipients, viral respiratory infections in the post-transplant period are frequent and sometimes prolonged. Preventive measures must be tightened in this population in order to reduce the derived morbidity and mortality.