Adenovirus Viremia is Associated With Substantially Prolonged Hospitalization in Pediatric Allogeneic Hematopoietic Cell Transplant Recipients

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BACKGROUND

• Allogeneic hematopoietic cell transplant (allo-HCT) is a resource-intensive procedure necessitating a prolonged stay in hospital in the post-transplant period.
• Estimates vary, but the average length of hospital stay after allo-HCT in pediatric patients has been reported as 39 days (range 16–77).1
• Post-transplant recovery period can be further prolonged by the occurrence of infection, including adenovirus (AdV) infection, substantially increasing healthcare costs.2
• As well as prolonged transplant hospitalization, viral infections such as AdV infections can lead to hospital readmission.1,3
• Pediatric allo-HCT patients are at particularly high risk of AdV infections in the post-transplant period, potentially prolonging length of hospital stay or leading to readmission.1,3
• To date, there is little published evidence on the impact of AdV infection on healthcare resource utilization, although the AdVance study prospectively analyzed the duration of hospitalizations among pediatric allo-HCT recipients with and without AdV infection from a large multicenter observational study.

METHODS

• AdVance is a multicenter, multinational study of the incidence, management, and clinical outcomes of AdV infections in adult and pediatric allo-HCT recipients in 7 countries in Europe: the United Kingdom, Spain, France, Italy, Germany, the Netherlands, and Czech Republic.
• This study was conducted retrospectively across 60 centers and included recipients of allo-HCT between January 2013 and September 2015.
• Pediatric allo-HCT recipients (n=18) who had AdV infection diagnosed (by the discharge summary) or if any positive AdV test was noted during the hospitalization.
• Hospitalizations were categorized as transplant hospitalization or rehospitalization (any hospitalization after discharge from the transplant hospitalization). Patients may have been readmitted more than once.
• Hospitalizations were further categorized according to whether AdV was noted in the discharge summary or if any positive AdV test was noted during the hospitalization.
• For hospitalizations during which a positive AdV test was noted, 2 subgroups were also analyzed those with any viremia and those with clinically relevant viremia (≥1000 copies/mL).
• In order to assess the potential impact of AdV infection on healthcare resource utilization, we analyzed the duration of hospitalizations among pediatric allo-HCT recipients with and without AdV infection from a large multicenter observational study.

RESULTS

• Overall, the AdVance study included 1738 pediatric allo-HCT recipients, of whom, 588 were diagnosed with an AdV infection in the first 6 months following allo-HCT transplant. After excluding data from 36 patients who died during the initial transplant hospitalization and 2 patients for whom hospitalization data were not available, data were available for 520 pediatric allo-HCT recipients.
• At the transplant hospitalization, 155 had no positive AdV test, and 365 had a positive AdV test, 208 of whom had AdVemia, and 144 developing clinically relevant viremia (≥1000 copies/mL).
• The median duration of the transplant hospitalization was 54 days (range 18-499) for patients with a positive AdV test, 65 days (range 27-499) for patients who had any AdVemia, and 64 days (range 27-499) for those with clinically relevant viremia ≥1000 copies/mL (Figure 1).
• In contrast, patients who did not have AdV infection during the transplant hospitalization, the median length of stay was 42 days (p=0.01 for comparisons with patients with any positive AdV test or viremia).
• For readmissions, median length of stay was also longer for those patients who had AdVemia (19 days) or viremia ≥1000 copies/mL (21 days), compared with those in which the patient did not have a positive AdV test 15 days during that readmission (Figure 2).
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CONCLUSIONS

• AdV infection in pediatric allo-HCT recipients is associated with significant medical resource utilization, as measured by duration of hospital stay.
• Pediatric allo-HCT recipients with AdVemia ≥1000 copies/mL were hospitalized 22 days longer than those without AdV infection.
• In pediatric patients with AdVemia ≥1000 copies/mL, longer hospitalizations were observed for those patients with non-malignant immunodeficiency.
• Subsequent readmissions were also longer for these patients.
• Additional analysis from the AdVance study (see poster B043) has shown that screening and monitoring for AdV in pediatric allo-HCT recipients is almost universal and frequent and patients are treated according to current best practices.
• In this analysis, patients who reached clinically relevant viremia ≥1000 copies/mL during their hospitalization had the longest duration of stay during both the transplant hospitalization and subsequent readmissions.

REFERENCES


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CONFlicts OF INTEREST

APM, CS, and RV are investigators in the AdVance study sponsored by Chimerix. D, EB, and GR are employees of the study sponsor, Chimerix, JH is an employee of Analytica Laser, a research consultancy who conducted the study on behalf of Chimerix, Chimerix.

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