First-Year Incidence of Adenovirus Infections Following Allogeneic Hematopoietic Cell Transplantations in a Pediatric Population

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INTRODUCTION

Disseminated adenovirus (AdV) infection is associated with high mortality in the pediatric population who have undergone hematopoietic cell transplantation (HCT).

The incidence and prevalence of disseminated AdV are not well described.

Our objective was to describe the first-year incidence of AdV infection in pediatric recipients of allogeneic HCT(s) enrolled in a US health insurance plan.

METHODS

Data source

Data for this study were extracted from the MarketScan Research Databases, which contain healthcare insurance claims records for commercial and Medicare patients. Patients

Patients were included in the study if they had a relevant International Classification of Diseases, Ninth Revision (ICD-9) or Current Procedural Terminology code for an allo-HCT between June 26, 2010, and June 30, 2014. Patients who were less than 20 years old (pediatric population) at the time of the index procedure.

Patients were included in the study if they had a relevant International Classification of Diseases, Ninth Revision (ICD-9) code for an allo-HCT procedure code for an allo-HCT between June 26, 2010, and June 30, 2014. Patients who were less than 20 years old (pediatric population) at the time of the index procedure.

Patients must have had at least 360 days of health insurance plan enrollment prior to the allo-HCT procedure.

The first admission for an allo-HCT procedure for each patient was defined as the index procedure.

Baseline characteristics

Demographic and clinical characteristics reported in the MarketScan Research Databases, which contain healthcare insurance claims records for commercial and Medicare patients. Patients

Patients were included in the study if they had a relevant International Classification of Diseases, Ninth Revision (ICD-9) or Current Procedural Terminology code for an allo-HCT between June 26, 2010, and June 30, 2014. Patients who were less than 20 years old (pediatric population) at the time of the index procedure.

Patients must have had at least 360 days of health insurance plan enrollment prior to the allo-HCT procedure.

The first admission for an allo-HCT procedure for each patient was defined as the index procedure.

Statistical analysis

Mean (standard deviation [SD]) or n (%) were reported for baseline characteristics. AdV infection: Number and percentage of patients with at least one ICD-9 code for AdV infection. Incidence rate for AdV infection defined as the number of infections divided by total patient-years of follow-up.

Time to first AdV infection diagnosis: mean (SD), median, first quartile (Q1) and third quartile (Q3).

RESULTS

Study population

350 pediatric allo-HCT recipients were identified within the MarketScan Research Databases as meeting the inclusion criteria, with a mean age of 10.2 (SD=5.4) years; 205 (58.6%) were male (Table 1).

Most patients (n=248, 70.9%) were on a commercial Preferred Provider Organization/Point-of-Service (PPO/POS) type insurance plan.

Most patients lived in the southern region of the US (n=177, 50.6%).

Underlying conditions associated with an increased risk for AdV infection were reported for patients with evidence of AdV infection. Table 2, Figure 3

Outcome measures

In any other place of service when the first ICD-9 diagnosis code for AdV infection was not associated with the initial transplant admission nor a hospital reimbursement code (i.e., a non-hospital setting).

Statistical analysis

For all statistical tests, the significance level was set to p<0.05. AdV infection: Number and percentage of patients with at least one ICD-9 code for AdV infection. Incidence rate for AdV infection defined as the number of infections divided by total patient-years of follow-up.

Time to first AdV infection diagnosis: mean (SD), median, first quartile (Q1) and third quartile (Q3).

The majority of patients had one or two pre-specified underlying conditions for which the transplant was performed.

Allogeneic hematopoietic cell transplantation recipients within the 365 day post-transplantation period.

AdV infection tends to occur within the first few months after HCT.

At least one ICD-9 code for AdV infection during the 365 day post-transplant period was associated with a readmission after discharge from the initial transplant admission.

Figure 2. Distribution of time to first adenovirus infection diagnosis in pediatric allogeneic hematopoietic cell transplantation recipients.

DISCUSSION

The true incidence of pediatric AdV infection may be higher than it is possible that not all AdV infections were detected. This could be due to a lack of specific screening for AdV, the potential use of non-specific ICD-9 codes in the insurance claims, and under-identification of infected patients.

ADDITIONAL INFORMATION

Addendum to Table 1

AdV infection tends to occur within the first few months after HCT.

At least one ICD-9 code for AdV infection during the 365 day post-transplant period was associated with a readmission after discharge from the initial transplant admission.

CONCLUSIONS

Almost 1 in 10 pediatric allo-HCT recipients from this US healthcare database were documented as having an ICD-9 Diagnosis code for AdV infection within the first year post-allo-HCT.

AdV infection tends to occur within the first few months after allo-HCT.

Based on these findings, and given the high mortality rate reported for pediatric HCT recipients with disseminated AdV infection, proactive screening should be considered, especially in the first few months after transplant.

REFERENCE


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DISCLOSURES

None of the authors of this manuscript have financial conflicts of interest or other competing interests.

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PREVENTION AND TREATMENT OF ADENOVIRUS INFECTIONS FOLLOWING ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANTATION IN A POPULATION-LEVEL HEALTH DATABASE.

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