ABSTRACT

Multiple myeloma (MM) patients are at increased risk of respiratory viral infections (RVIs) due to disease-related alterations in their immune systems. Data in the literature specific to MM patients is limited. We reviewed four years of multiplex respiratory viral panel (RVP) data in MM patients at our institution to evaluate incidence and seasonality of RVIs.

BACKGROUND

This retrospective study is a descriptive study that reports four-year data of RVIs in MM patients. Data was obtained from respiratory viral panel polymerase chain reaction (PCR) results during the years 2013 to 2016.

RVIs complicate the clinical outcomes in MM patients, adding to their morbidity and mortality. MM patients are at increased risk due to disease-related alterations in their immune systems, including B-cell, T-cells, dendritic cells and natural killer cells. As new treatment regimens have extended life expectancy, these patients undergo cumulative therapies, which have also shown to increase the risk of RVIs. The diagnosis of RVIs has become more sensitive with the advent of PCR, and specifically multiplex respiratory viral panels that can evaluate for multiple viruses with one respiratory sample.

METHODS

The results from all positive RVPs, obtained via nasopharyngeal swab and as identified by polymerase chain reaction during the years 2013 to 2016, were analyzed. A positive result less than 6 weeks apart was considered a duplicate and removed. All specimens were analyzed in the molecular diagnostics laboratory using the eSensor® Respiratory Viral Panel (GenMark Dx., Carlsbad, CA). This assay is a qualitative nucleic acid multiplex in vitro diagnostic test that provides for the simultaneous detection and identification of 14 respiratory viral nucleic acids.

RESULTS

RVIs were reported in every month in all four years. The peak months were January and February, driven by the peak activity of Influenza A and B (INF) and respiratory syncytial virus A and B (RSV). Rhinovirus was isolated the most frequently. The least isolated was Adenovirus species B/E and C. A seasonality was observed with INF, RSV, parainfluenza 1, 2 and 3 (PIV) and human metapneumovirus (hMPV); however, infections with each virus occurred outside of peak months including an outbreak of INF in July and August 2013.

The total number of viral infections varied each year as did the total number for each virus. The year 2015 had the lowest number of RVIs reported at 427, and the year 2014 had the most RVIs reported at 478. However, 2014 was not the peak incidence for each virus; it was the peak incidence for PIV. Due to the increase in RSV infections in 2016, genome sequencing was completed which revealed that multiple strains contributed to this outbreak, suggesting a community source of infection rather than nosocomial-derived.

CONCLUSIONS

• RVIs are more common than previously described in MM patients.
• RVIs occur in every month throughout the year. Although a seasonality is seen with these viral infections, infections do occur outside of the months considered to be peak months for each virus.
• Infection control policies, therefore, must be enforced year round. More studies, however, are needed to assess the proportion of community versus healthcare acquired.

REFERENCES

