RSV SUBGROUPS A AND B EPIDEMIOLOGY AND DIFFERENCES IN CLINICAL SEVERITY

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Introduction

Understanding differences between RSV-A and RSV-B circulating subgroups provides insights for the development of prevention strategies and public health interventions.

RSV has two major antigenic subgroups, A and B. These subgroups co-circulate annually, but there is considerable debate as to whether clinical severity is impacted by the group of the infecting RSV strain.

We aimed to describe the global distribution of RSV-A and RSV-B subgroups and compare their clinical severity.

Methods

A literature review from PubMed and Google Scholar (1986-2022) was performed and extended using snowballing from references in captured publications.

Among 121 references reviewed, 57 were included in this analysis.

Results

Global distribution of RSV-A and RSV-B (1990 – 2021)

Both RSV strains generally co-circulate within a season, with predominance varying over seasons and countries.

Among 137 RSV seasons analyzed in 29 countries covering both hemispheres between 1990 and 2021, RSV-A was predominant in 75 seasons (54.7%), RSV-B was predominant in 49 seasons (35.8%) and 13 seasons (9.5%) had no clear predominance. For 63 of these seasons, the exact proportions of RSV-A and RSV-B co-circulating were available.

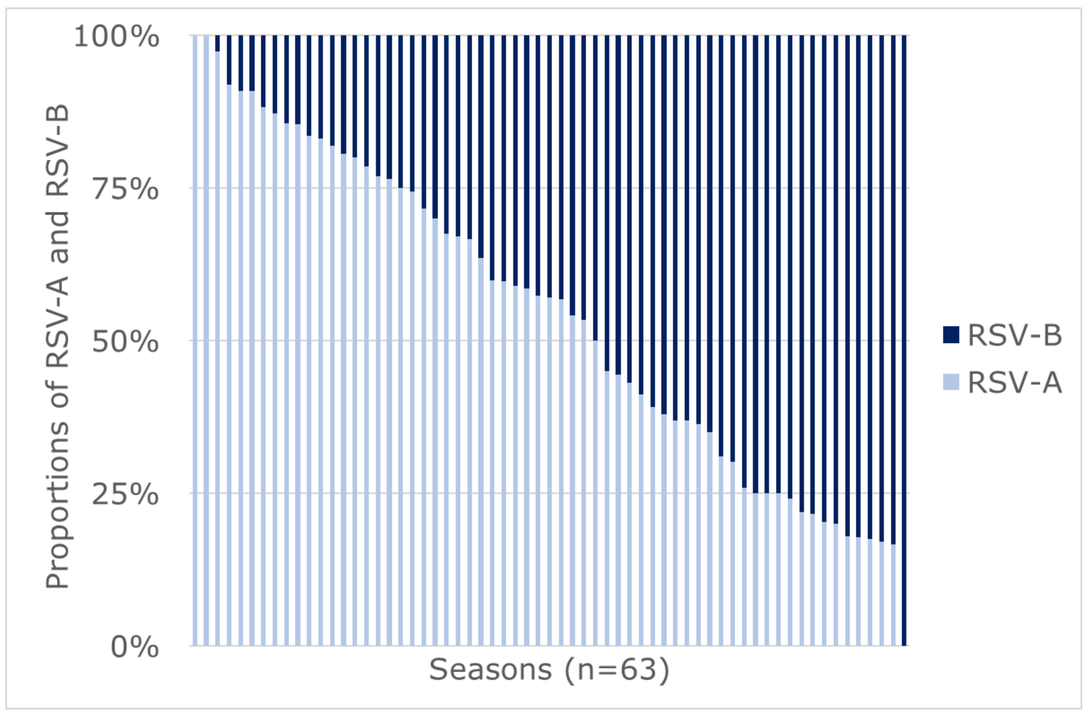

Figure 1 Proportions of RSV-A to RSV-B per season (n=63) plotted per decreasing frequency of RSV-A. Countries included are Algeria, Australia, Brazil, China, Egypt, Finland, Germany, Great Britain, Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Netherlands, Pakistan, Saudi Arabia, South Africa, South Korea, Spain, Taiwan, Tunisia, US, Yemen.

Genomic diversity

In both the northern and southern hemispheres, genotype diversity decreased over the study period. Since 2015, ON1 and BA9 became worldwide the sole genotypes detected for RSV-A and RSV-B, respectively, in the 14 countries with available data from 10 publications.

Clinical Severity

Of 46 studies reporting RSV subgroup impact on clinical severity, 14 studies reported that subgroup A infection resulted in more severe outcomes, whereas two studies reported that subgroup B infection resulted in more severe outcomes, and one was inconclusive.

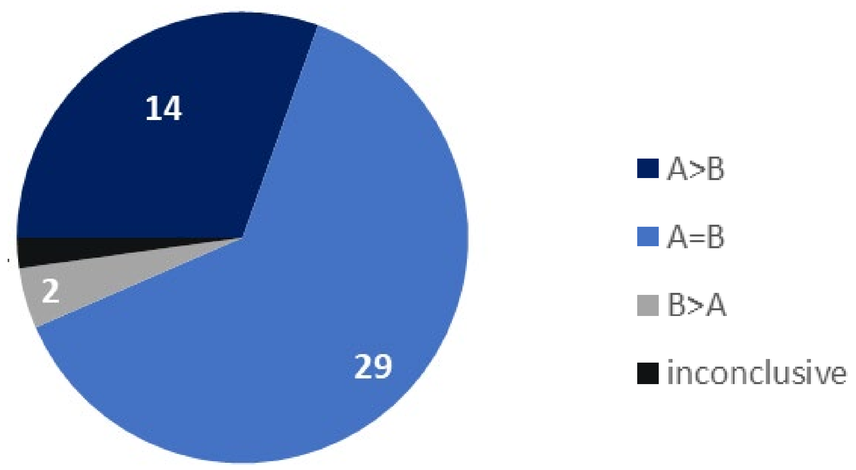

Figure 2. Proportions of studies reporting RSV subgroup impact on clinical severity.

Conclusion

RSV-A and RSV-B both contribute substantially to the global RSV burden, with a tendency for higher disease severity due to RSV-A.

However, firm conclusions are hampered due to high study heterogenicity regarding study period, population, study design and methodology and definition of clinical severity.

Implication

A limited number of genotypes circulating each year would facilitate vaccine and monoclonal antibody therapy development.

Prevention strategies should ensure that both subgroups are targeted to avoid one subgroup does becomes dominant and/or escape immunity strategies once prevention programs are deployed.

References

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