

## Comparative Effectiveness of COVID-19 Vaccines

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Received date: October 18, 2022, Manuscript No. IPJPM-22-14844; Editor assigned date: October 21, 2022, PreQC No. IPJPM-22-14844 (PQ); Reviewed date: November 07, 2022, QC No. IPJPM-22-14844; Revised date: March 16, 2023, Manuscript No. IPJPM-22-14844 (R); Published date: March 23, 2023, DOI: 10.36648/2572-5483.8.3.186

Citation: Javed K (2023) Comparative Effectiveness of COVID-19 Vaccines. J Prev Med Vol:8 No:3

### Introduction

Comparative effectiveness of COVID-19 vaccines is a research study that includes 23 cases of commonly used COVID-19 vaccines administered in Pakistan. The data was collected through semi-structured interviews in tertiary healthcare hospitals in the Hazara region [1]. The study utilized post vaccination relapse of disease or breakthrough infections as criteria to assess the comparative effectiveness of COVID-19 vaccines. The data was analyzed using SPSS and Microsoft Excel-2016 [2]. Results suggested that Pfizer was most effective to prevent breakthrough infection and relapse of disease, while Sputnik-V was most effective to reduce the severity of symptoms on relapse. Investigate SARS-CoV-2 breakthrough infections among healthcare workers who received the COVID-19 vaccine to identify trends or clustering in patient characteristics, the administered vaccine and their comparative effectiveness to prevent relapse and severity of symptoms [3,4].

### Data collected

Total 23 healthcare workers included *i.e.*, 15 doctors, 5 nurses and 3 other HCW.

Sinovac cases=15

Sputnik-v cases=4

AstraZeneca cases=3

Pfizer cases=01

Total relapse cases=05

### Description

#### Comparative effectiveness

The data analysis using SPSS and Microsoft Excel-365. Suggests that the majority (95%) of the HCWs who reported clinical symptoms of breakthrough infection had either severe fever (100%) New olfactory disorder (100%) and new taste disorder (100%) while 90% of the HCWs had >3 severe and moderate symptoms. The most frequent symptoms included fever (100%), cough (60%), headache (100%), malaise (60%), sore throat (70%), runny nose (70%) and shortness of breath (90%) (Figures 1 and 2).

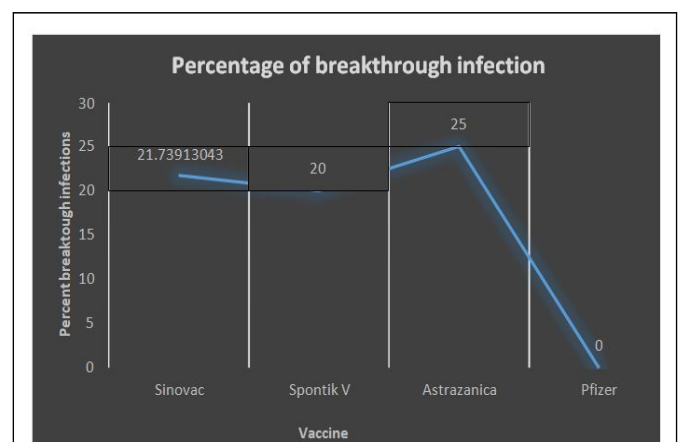


Figure 1: Percentage of breakthrough infection.

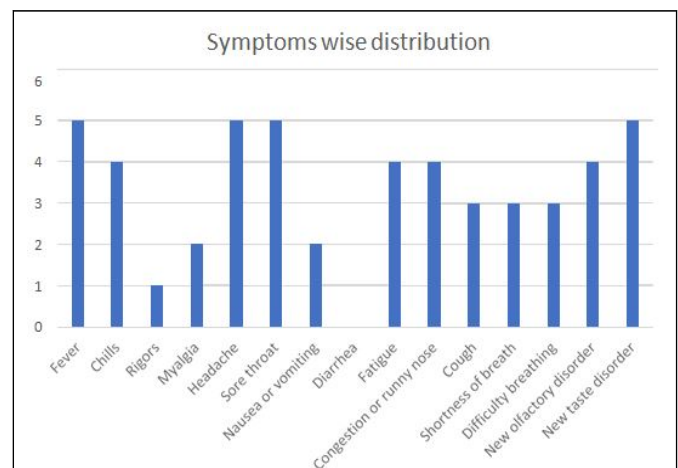
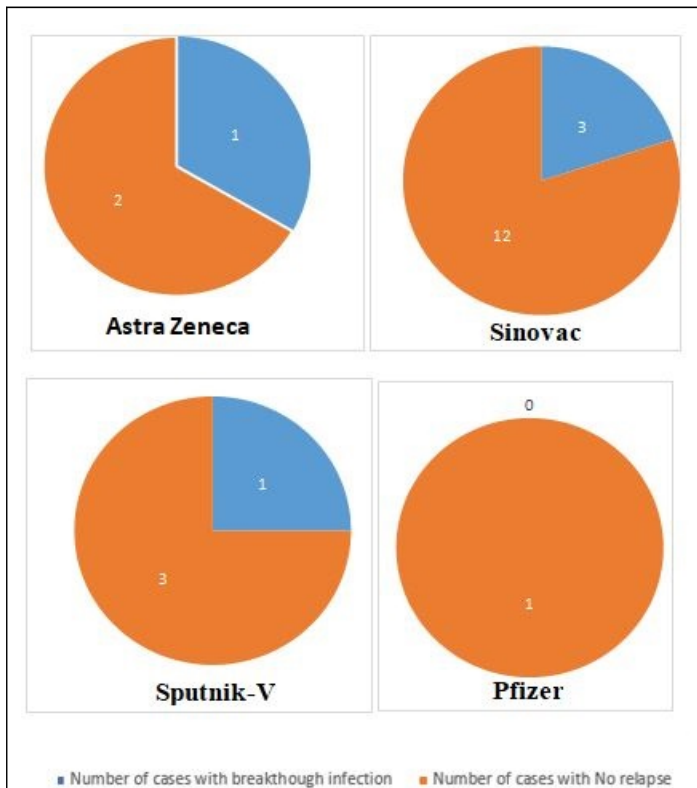


Figure 2: Symptoms wise distribution.

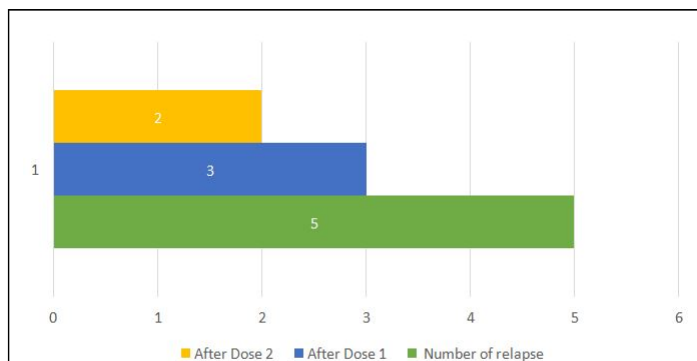
#### Individual vaccine analysis

Individual vaccine analysis suggested that most breakthrough infections occurred with AstraZeneca 1/3 (33.3%) followed by Sinovac 3/16 (21.7%), Sputnik-V 1/4 (25%) and Pfizer 0/1 (0%) [5,6]. A comparison of the vaccine based on the percentage of relapse of breakthrough infections suggests that Pfizer was most effective in preventing post-vaccination relapse of disease while AstraZeneca was least effective in the population studied. Most relapse or breakthrough infections occurred after the first dose 3/5 (60%) while 2/5 (40%) after the second dose [7]. The data on

effectiveness for Pfizer is currently limited due to a shortage of vaccines in-country online foreign visitors are allowed to take this vaccine (Figures 3 and 4).



**Figure 3:** Individual vaccine analysis suggested that most breakthrough infections occurred with AstraZeneca 1/3 (33.3%) followed by Sinovac 3/16 (21.7%), Sputnik-V 1/4 (25%) and Pfizer 0/1 (0%).



**Figure 4:** Relapse after dose number.

## Conclusion

In conclusion, the current report reconfirms the possibility of post-vaccination COVID-19 infection among HCWs. Although the results cannot be generalized because of limited population inclusion and neglecting the other elements including individual condition, rate of exposure, underlying health conditions and medications. A comparison of vaccine effectiveness based on clinical symptoms on relapse shows that all vaccine is equally effective to reduce the severity of symptoms in a post-vaccination relapse of disease. Sputnik-V was found more effective in reducing the severity of the new olfactory disorder in a patient with a relapse of the disease as well as it reduces the severity of all other symptoms compared to other alternatives.

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