



Side effects of four COVID-19 vaccines: A preliminary systematic review and meta analysis

Priyath D Seneviratne, Ashwini Wijeweera, KGDH Seneviratne, Kasun Lakmal
Dineshani Hettiarachchi, Suranjith L Seneviratne

Faculty of Medicine, University of Colombo, Sri Lanka



Introduction

Since the onset of the Covid pandemic, a number of vaccines with diverse mechanisms of action have been developed and are currently in global use. This meta-analysis and systematic review aims to compare the reported adverse effects of four Covid vaccines (Pfizer-BioNTech, Oxford-AstraZeneca, Sinopharm-BBIBP and Moderna)

Objectives

A literature search was conducted using PubMed and Cochrane Review databases. Following screening and filtering of 918 publications, an analysis of the safety and reactogenicity data from nine Randomised Controlled Trials (RCTs) investigating one or more of the four vaccines were done. The studies explored the safety and reactogenicity following administration of two homologous doses of any of the four vaccines, in healthy Asian participants older than 12 years.(ref Fig 1)

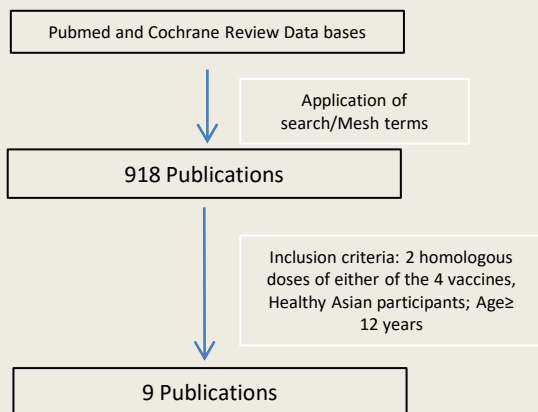


Fig. 1- Study screening procedure. Search terms used: (COVID-19 vaccine OR SARS-CoV-2 vaccine OR RNA-based COVID-19 vaccine OR mRNA COVID-19 vaccine OR Pfizer-BioNTech COVID-19 vaccine OR BNT162 vaccine OR BNT162 OR BNT162b1 OR BNT162b2 OR Tozinameran OR Comirnaty OR Moderna COVID-19 Vaccine OR Spikevax OR mRNA-1273 OR CX-024414 OR Elasmomeran OR AstraZeneca COVID-19 Vaccine OR Vaxzevria OR ChAdOx1 COVID-19 vaccine OR ChAdOx1 nCoV-19 vaccine OR AZD1222 OR AZD-1222 OR ChAdOX1-S recombinant OR Covishield OR Inactivated Vaccines OR inactivated SARS-CoV-2 vaccine OR BBIBP-CorV vaccine OR BBIBP-CorV Vero Cells OR Sinopharm) AND (Toxicity OR Vaccine Immunogenicity OR side effects OR adverse events OR adverse effects) AND (randomized controlled trial OR double blind method OR clinical trial OR cohort study)

References

Suranjith L Seneviratne, Pamodh Yasawardene, Dineshani Hettiarachchi, Danuksha K Amarasena, Widuranga Wijerathne, Buddhika Samaraweera, Darrel Mathew, Visula Abeyesuriya. The Delta variant of SARS-CoV-2: The current global scourge. Sri Lankan Family Physician 2021; 36; 17-25

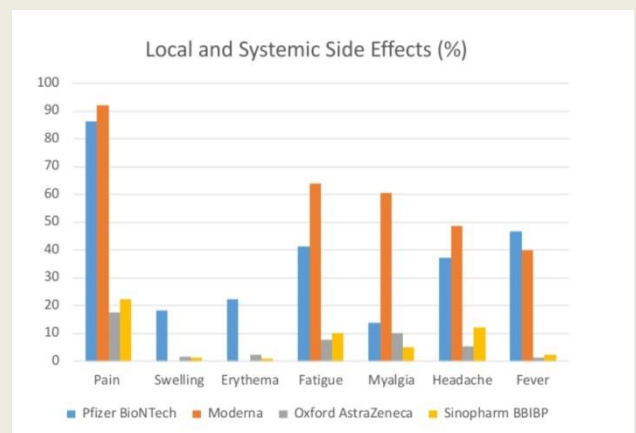


Fig. 2- Comparison of the percentages of side effects among the different COVID-19 Vaccines

Results

Pain at the injection site was the commonest local side effect (Pfizer: 86.2% [95% CI: 79.2% – 93.2%]; AstraZeneca: 17.7% [95% CI: 14.4% – 21.1%]; Sinopharm: 22.3% [95% CI: 21.7% - 23.0%]; Moderna: 92% [95% CI: 87.7% – 96.3%]). Of the systemic side effects, fever and myalgia were most common in those receiving the Pfizer (46.8% [95% CI: 36.7% – 56.9%]) and AstraZeneca (10% [95% CI: 7.34% – 12.7%]) vaccines respectively. Headache and fatigue were the commonest systemic adverse effects with the Sinopharm (12% [95% CI: 11.5% – 12.5%]) and Moderna (64% [95% CI: 56.3% – 71.7%]) vaccines respectively.

Conclusions

Some side effects were commoner with mRNA-based vaccines compared to the adenovirus vectored vaccines and inactivated vaccines. No severe life-threatening adverse effects were reported