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Original Research

Disproportionality analysis of adverse neurological and psychiatric reactions with the ChAdOx1 (Oxford-AstraZeneca) and BNT162b2 (Pfizer-BioNTech) COVID-19 vaccines in the United Kingdom

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ABSTRACT

Background

Information on neurological and psychiatric adverse events following immunization (AEFIs) with COVID-19 vaccines is limited.

Research design & methods

We examined and compared neurological and psychiatric AEFIS reports related to

Results

As of 30 June 2021, 46.1 million doses of ChAdOx1 and 30.3 million doses of BNT162b2 had been administered. The most frequently reported AEFI was headache with 1,686 and 575 cases per million doses of ChAdOx1 and BNT162b2, respectively. AEFIs more frequently reported after CHAdOx1 compared with BNT162b2 vaccination were Guillain-Barré syndrome (OR, 95% CI = 2.53, 1.82–3.51), freezing (6.66, 3.12–14.22), cluster headache (1.53, 1.28–1.84), migraine (1.23, 1.17–1.30), postural dizziness (1.24, 1.13–1.37), tremor (2.86, 2.68–3.05), headache (1.40, 1.38–1.43), paresthesia (1.11, 1.06–1.16), delirium (1.85, 1.45–2.36), hallucination (2.20, 1.82–2.66), poor quality sleep (1.53, 1.26–1.85), and nervousness (1.54, 1.26–1.89). Reactions less frequently reported with ChAdOx1 than with BNT162b2 were Bell's palsy (0.47, 0.41–0.55), anosmia (0.58, 0.47–0.71), facial paralysis (0.35, 0.29–0.41), dysgeusia (0.68, 0.62–0.73), presyncope (0.48, 0.42–0.55), syncope (0.63, 0.58–0.67), and anxiety (0.75, 0.67–0.85).

Conclusion

Neurological and psychiatric AEFIs were relatively infrequent, but each vaccine was associated with a distinctive toxic profile.

Plain Language Summary

We examined reports on adverse neurological and psychiatric effects following immunization with BNT162b2 (Pfizer-BioNTech) and ChAdOx1 (Oxford-AstraZeneca) for COVID-19 to the United Kingdom Medicines and Healthcare products Regulatory Agency between 9 December 2020 and 30 June 2021. Adverse effects following immunization (AEFIs) were relatively infrequent. Compared to BNT162b2, Guillain-Barré syndrome, freezing phenomenon, cluster headache, migraine, postural

and nervousness were more frequently reported for ChAdOx1. Reactions less frequently reported for ChAdOx1 than for BNT162b2 were Bell's palsy, anosmia, facial paralysis, dysgeusia, presyncope, syncope, and anxiety.

Q KEYWORDS: COVID-19 vaccines ChAdOx1 BNT162b2 pharmacovigilance safety neurology psychiatry

Declaration of interests

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

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Author contributions

Dr. Perez-Lloret had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Designed the study: SP Lloret, N Petrovsky. Accessed the data: SP Lloret, N Petrovsky. Analyzed the data: SP Lloret. Interpreted the results: SP Lloret, N Petrovsky, A Alami, JAG Crispo, D Mattison, MO Losada, F Capani, D Krewski, C Goetz. Drafted the manuscript: SP Lloret, MO Losada. Revised the manuscript: MO Losada, N Petrovsky, A Alami, JAG Crispo, D

Data sharing

The data from this study can be accessed at the Medicines and Healthcare products Regulatory Agency website: <https://www.gov.uk/government/publications/coronavirus-covid-19-vaccine-adverse-reactions/coronavirus-vaccine-summary-of-yellow-card-reporting>

Supplementary material

Supplemental data for this article can be accessed online at <https://doi.org/10.1080/14740338.2022.2120607>

Correction Statement

This article has been republished with minor changes. These changes do not impact the academic content of the article.

Additional information

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