



Anaphylactic Reaction in a Child After Dose of Pfizer-BioNTech COVID-19 Vaccine

Reem W Alreshidi¹, Malik Almalki^{1*}, Shaker Alreshidi² and Mohammad Almalki³

¹Department of Pediatrics, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

²King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia

³King Saud Medical City, Riyadh, Saudi Arabia

*Corresponding Author: Malik Almalki, Department of Pediatrics, Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

DOI: 10.31080/ASPE.2022.05.0557

Received: July 05, 2022

Published: September 26, 2022

© All rights are reserved by Malik Almalki, et al.

Abstract

Background: The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infected millions of people of all ages worldwide to date. The majority of confirmed cases were among adults and approximately 2% of the confirmed cases are for children. Covid-19 vaccine had high safety and efficacy. Nevertheless, adverse reaction has been reported, approximately 90% of all vaccine recipients reported local and at least one systemic reaction. In this case report, we report a case of anaphylactic reaction in a child after dose of Pfizer-BioNTech COVID-19 vaccine. Up to our knowledge, this is the first case to be reported of anaphylactic reaction in a child after dose of Pfizer-BioNTech COVID-19 vaccine.

Observations: A 13 year old boy, presented to our paediatric emergency department (PED) with anaphylactic reaction, complaint of rash and shortness of breath (SOB) 13 minutes after received first dose Pfizer-BioNTech COVID-19 vaccine. management involved systemic epinephrine, antihistamine and steroid.

Conclusions and Importance: Due to the recent authorization of COVID-19 vaccine in children of 12 years or older, children with anaphylaxis post- vaccination are expected. In addition to the necessary observation at vaccine centre, necessary supplies to immediately manage anaphylaxis, should be available in vaccination centres.

Keywords: COVID-19; Vaccine; Allergy; Anaphylaxis; Paediatric; Adverse Effect

Introduction

Since COVID-19 pandemic started, the disease has paralysed the international health system along with the economic systems, were many of the countries have established international and national restriction to rescue the health system and to survive through the crisis.

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infected more than 200 millions of people of all ages worldwide to date [1]. The majority of confirmed cases were among adults and approximately 2% of the confirmed cases are for children (underage of 15 years) [2, 3]. In addition, reports demonstra-

ted low risk of severe illness in paediatric age group especially with patients have associated comorbidities. And only 2% of paediatric patients were admitted with critical condition and required Paediatric Intensive Care Unit (PICU) admission [4].

Covid-19 vaccine had emergency authorization by US Food and Drug Administration, (FDA), the high safety and efficacy encouraged the administration [13]. In a recent study, COVID-19 vaccine in 12-to-15-year-old recipients had a favourable safety profile, produced a greater immune response than in young adults, and was highly effective against Covid-19 [7].

In this case report, we report a case of anaphylactic reaction in a child after dose of Pfizer-BioNTech COVID-19 vaccine. Up to our knowledge, this is the first case to be reported of anaphylactic reaction in a child after dose of Pfizer-BioNTech COVID-19 vaccine

Case Presentation

A 13 year old boy, brought by ambulance to our paediatric emergency department (PED), from COVID-19 vaccination centre, with complaint of rash and shortness of breath (SOB) Symptoms started 13 minutes after received first dose Pfizer-BioNTech COVID-19 vaccine and luckily he was still in observation after vaccination, Given the clinical presentation of facial redness with shortness of breath, no history of vomiting or diarrhoea, no history of headache or loss of consciousness, no history of lip or mouth swelling He received one dose of Epinephrine and transferred by ambulance to ER His medical history known of bronchial asthma, And his allergy history showed that he allergic to food (not specified) and medication (i.e., NSAIDs), with a family history: of allergy to food and drugs as well.

examination revealed O₂ saturation (92%), blood pressure 109/68, and heart rate of 80 BPM, The child is obese 111kg (above 95 percentile), patient had difficulty in breathing, SOB, hoarseness, diffuse facial redness with rash all over the chest, Lab tests revealed wbc 15 anc 61.7% lymphocytes 32.6%, Eosinophil 0.6, HbG 13.8, plt 389, Creatinine 64 micromol/l, urea 4 micromol/l, Na 138 micromol/l, k 3.2 micromol/l, chloride 104 micromol/l, phosphate 1.40 micromol/l, Blood gas: ph 7.36., co₂ 5.5, Hco₃ 24, lactate 2.7. In pediatric emergency department (PED), management involved systemic epinephrine, antihistamine and steroid. After stabilisation, allergy evaluation done, patient and family were instructed and educated about the condition and discharged with Epinephrine PEN for emergency indentions.

Discussion

Covid-19 vaccine had emergency authorisation by US Food and Drug Administration, (FDA), children an important part of whole population to build immune barrier against COVID 19.

In Saudi Arabia, more than 500, 000 individual had confirmed diagnosis of COVID-19. With similar percentage of paediatric age group (2%) [5] Moreover, Saudi is considered on the first countries authorised paediatric COVID-19 vaccination (12 years of age

or older). More than 35 millions of COVID-19 vaccines were given till date [6].

In a recent study, COVID-19 vaccine in 12-to-15-year-old recipients had a favourable safety profile, produced a greater immune response than in young adults, and was highly effective against Covid-19 [7]. Nevertheless, adverse reaction has been reported, approximately 90% of all vaccine recipients reported local and at least one systemic reaction within the first week of receiving the vaccine. The systemic adverse events was higher in frequency and severity after the second dose than the first dose. Fatigue, headache, chills, and new or worsened muscle pain were the most common. Overall most of systemic events were mild or moderate in severity, after both doses [8].

Anaphylaxis is a life-threatening allergic reaction that occurs rarely after vaccination, with onset typically within minutes to hours which requires immediate management [10, 11].

Anaphylaxis was reported in adults as (a rate of 11.1 per million doses administered for Pfizer-BioNTech COVID-19 vaccine [9], 2.5 per million doses administered for Moderna vaccine [12]), Most (90%) reported anaphylaxis cases after receipt of Pfizer-BioNTech COVID-19 vaccine occurred in women. The median interval from vaccine receipt to symptom onset was 13 (10-30) minutes. The most common symptoms and signs were urticaria, angioedema, rash, and a sense of throat closure. No death or critical sequences were reported after anaphylaxis. With history of food allergy (e.g., Eggs and milk) in 5% and food and drug allergy in 81% [9].

In the other hand, US Vaccine Adverse Event Reporting System (VAERS) had identified cases of non-anaphylaxis allergic reactions after Pfizer-BioNTech COVID-19 vaccination. Commonly reported symptoms in non-anaphylaxis allergic reactions included pruritus, rash, itchy and scratchy sensations in the throat, and mild respiratory symptoms [9].

In this report case, the diagnosis certainty was level 1, according to Brighton Collaboration Anaphylaxis Working Group [14].

Conclusion

Due to the recent authorisation of COVID-19 vaccine in children of 12 years or older, children with anaphylaxis post-vaccination are

expected. In addition to the necessary observation at vaccine centre, necessary supplies to immediately manage anaphylaxis, should be available in vaccination centres.

Acknowledgments

Sincere gratitude and thanks to our government and to Saudi Ministry of Health.

Bibliography

1. WHO Records COVID-19.
2. Shekerdemian LS, *et al.* "Characteristics and outcomes of children with coronavirus disease 2019 (COVID-19) infection admitted to US and Canadian pediatric intensive care units". *JAMA Pediatric* 174 (2020): 868-873.
3. Dong Y, *et al.* "Epidemiology of COVID-19 among children in China". *Pediatrics* 145 (2020): e20200702.
4. Liguoro I, *et al.* "SARS-COV-2 infection in children and newborns: a systematic review". *European Journal of Pediatrics* 179 (2020): 1029-1046.
5. YM Kazzaz, *et al.* "Hospital preparedness and management of pediatric population during COVID-19 outbreak". *Annals of Thoracic Medicine* 15 (2020): 107-117.
6. Ministry of Health. MOH Records COVID-19.
7. Frenck RW, *et al.* "C4591001 Clinical Trial Group. Safety, Immunogenicity, and Efficacy of the BNT162b2 Covid-19 Vaccine in Adolescents". *The New England Journal of Medicine* 385.3 (2021): 239-250.
8. Local Reactions, Systemic Reactions, Adverse Events, and Serious Adverse Events: Pfizer-BioNTech COVID-19 Vaccine, CDC (2021).
9. Shimabukuro T and Nair N. "Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine". *JAMA* 325.8 (2021): 780-781.
10. Rüggeberg JU, *et al.* "Anaphylaxis: case definition and guidelines for data collection, analysis, and presentation of immunization safety data". *Vaccine* 25.31 (2007): 5675-5684.
11. Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Moderna COVID-19 Vaccine - United States, December 21, 2020-January 10, 2021". *Morbidity and Mortality Weekly Report* 70 (2020): 125-129.
12. Polack FP, *et al.* "C4591001 Clinical Trial Group. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine". *The New England Journal of Medicine* 383.27 (2020): 2603-2615.
13. Rüggeberg JU, *et al.* Brighton Collaboration Anaphylaxis Working Group. "Anaphylaxis: case definition and guidelines for data collection, analysis, and presentation of immunization safety data". *Vaccine* 25 (2007): 5675-5684.