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# A CASE REPORT REVIEW ON DRUG HYPERSENSITIVITY IN COVID VACCINATION

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**Abstract**

This case study is about adverse reactions on covid vaccine, The coronavirus was officially named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses based on phylogenetic analysis. SARS-CoV-2 is believed to be a spillover of an animal coronavirus and later adapted the ability of human-to-human transmission. Because the virus is highly contagious, it rapidly spreads and continuously evolves in the human population.some individuals experience few abnormal activites after getting vaccinated ,The purpose of this review artcle is to discuss about the hypersensitivity reactions occurred in a patient who took covid vaccination and the detailed study about adverse effects on covid vaccines and prevent the possible abnormal outcome after getting vaccinated for COVID-19. This case study will cover the complications occurring due to COVID-19 vaccines based on age factor, gender, brand, environmental status, weather, food interactions, drug interactions .

**KEYWORDS:** Drug hypersensitivity reactions,COVID-19 vaccine,Adverse effects,Anaphylaxis

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## Introduction

The corona virus has been one of the deadliest virus in the world ,it's a pandemic disease, COVID-19 was first reported in Wuhan, China, and subsequently spread worldwide. The coronavirus was officially named severe acute respiratory syndrome coronavirus 2 (SARS-CoV- 2) by the International Committee on Taxonomy of Viruses based on phylogenetic analysis.[1] On 24 June 2020, China approved the CanSino vaccine for limited use in the military, and two inactivated virus vaccines for emergency use in high-risk occupations. On 11 August 2020, Russia announced the approval of its Sputnik V vaccine for emergency use, though one month later only small amounts of the vaccine had been distributed for use outside of the phase 3 trial.[2]As of 12 January 2022, the following vaccines have obtained EUL: The Pfizer/BioNTech Comirnaty vaccine, 31 December 2020.,The SII/COVISHIELD and AstraZeneca/AZD1222 vaccines, 16 February 2021.The Janssen/Ad26.COV 2.S vaccine developed by Johnson & Johnson, 12 March 2021.,The Moderna COVID-19 vaccine (mRNA 1273), 30 April 2021.The Sinopharm COVID-19 vaccine, 7 May 2021.The Sinovac-CoronaVac vaccine, 1 June 2021.The Bharat Biotech BBV152 COVAXIN vaccine, 3 November 2021. The Covovax (NVX-CoV2373)vaccine, 17 December 2021.The Nuvaxovid (NVX-CoV2373) vaccine, 20 December 2021[3] In India, vaccination started in a phase-wise manner on 16 Jan 2021. Initially, Healthcare Workers (HCWs) were vaccinated with either COVISHIELD or COVAXIN vaccine. COVISHIELD had undergone phase I/II blinded randomized controlled trials in Apr-May 2020 in UK, Brazil, and South Africa with randomization done with the ChAdOx1nCoV 19 vaccine (COVISHIELD), and the MenACWY (standard Meningococcal vaccine) as the test and the control arms respectively. It showed that the spike specific T cell responses peaked on day 14 and IgGresponse by Day 28, and were boosted following the second dose. Neutralizing antibodies were found in 91% after a single dose and 100% after the second dose of the vaccine. Phase II/ III trials for this vaccine were carried out in the UK from May to Aug 20, with participants being enrolled in an age escalated manner that is between 18-55years, 56-69 years, and 70 years and older cohort. The results showed that the median anti-spike IgG response after 28 days was similar across all age groups. The analysis of data showed an acceptable safety profile among participants of the trial and also showed it to be better tolerated in older individuals.[4] Their vaccine type and composition is Recombinant, replication-deficient chimpanzee adenovirus vector encoding the SARS-CoV-2 Spike (S) glycoprotein. Non-medicinal Ingredients such as L-Histidine ,L-Histidine hydrochloride monohydrate acting as essential amino acids ,Magnesium chloride hexahydrate , Polysorbate 80 , Ethanol ,Disodium edetate dihydrate (EDTA) acting as stabilizer and the rest Sucrose ,Sodium chloride , Water for injection there are some contraindications and adverse effect reactions, Patients who have experienced major venous and/or arterial thrombosis in combination with thrombocytopenia following vaccination with any COVID-19 vaccine should not receive a second dose of ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant). Hypersensitivity reactions including anaphylaxis and angioedema have occurred following administration of COVISHEILD possible mentioned reactioms are Very Common or common1,2  Pain, tenderness, redness, bruising, warmth, itching, swelling, and induration at the injection site  Fever, chills  Fatigue, malaise  Headache, arthralgia, myalgia

- Nausea, vomiting, diarrhea  Pain in legs or arms  Influenza-like symptoms

(fever, sore throat, runny nose, cough, chills) Uncommon1 □ Hyperhydrosis □ Decreased appetite □ Lymphadenopathy □ Pruritis □ Rash □ Dizziness □ Somnolence □ Abdominal pain Rare1,2 □ Anaphylaxis □ Vaccine-Induced Immune Thrombotic Thrombocytopenia (VITT). □ Capillary Leak Syndrome. □ Guillain-Barre Syndrome

## CASE REPORT

A 41 one year old female has been admitted in a xyz hospital with the chief complaints of Maculopapular rash all over body with itching since 1 year ,water discharge and throat pain.the patient was completely alright before taking 1st dose of COVISHEILD) after one week she developed blisters ,the dermatologist treated her with steroids, it got subsided .After leaving medicines she got blisters all over the body

Table -1 Past medication history:

| S.NO | BRAND NAME | GENERNIC NAME | DOSE |
|---|---|---|---|
| **1.** | **Wysolone** | **Prednisolone** | **5mg** |
| **2.** | **Razo** | **razoprozole** | **20mg** |
| **3.** | **Mmf** | **Mycophenolate mofetil** | **500mg** |
| **4.** | **Xyzal** | **Levocetirizine** | **5mg** |
| **5.** | **Liquid Paraffin** | - | - |

She took corticosteroid, Gastric secretion inhibitor,immune suppressant,Anti-histamine medications from ,doctor advised her to take biopsy.she has no history of diabetes mellitus,hypertension ,asthma.her vitals are normal.

Table-2 labrotory investigations:

| parameters | 1st report | 2nd report | 3rd report |
|---|---|---|---|
| **Hb** | 7.0gm | 10.6gm | 10.5gm |
| **rbc** | 4.04million/cmm | 5.31Millions/cmm | 5.26Millions/cmm |
| **WBC** | 18,200mm$^3$ | 133000mm | 14300Cmm |
| **neutrophills** | 78% | 82% | 85 % |
| **eosinophills** | 12% | 02% | 01% |
| **monocytes** | 03% | 06 % | 04 %. |
| **lymphocytes** | 07% | 07% | 10% |
| **M.C.V.** | 62.2fL | 68.7fL | 68.9 fL |
| **M.CH** | 17.3 Po | 19.9 g | 20.0Pg, |
| **MCHC** | 27.8%, | 29.0% | 29.1% |
| **TSH** | 0:17 mU/ml | - | - |
| **T3** | 150g/ml | - | - |
| **T4** | 0.52 mg/d | - | - |

Routine investigation sent and revealed↓ Hb, ↑ WBC, ↓MCV, ↓MCH, ↓MCHC, ↑ RDW , ↓TSH ,

↓T4,↓T3By doing Peripheral Smear Study revealed microcytic hypochromic anaemia, neutrophilia, eosinophilia, Anisopoikilocytosis.USG showed normal study,2Units PRBC transfused post transition

HB improved .the skin biopsy revealed that the patient was diagnosed with bullous pemhigoid the biopsy shows subeepidermal bulla with an infiltrate of esinophills within the dermis and blister cavity.[8]

## TREATMENT

Table-3 Drug chart;

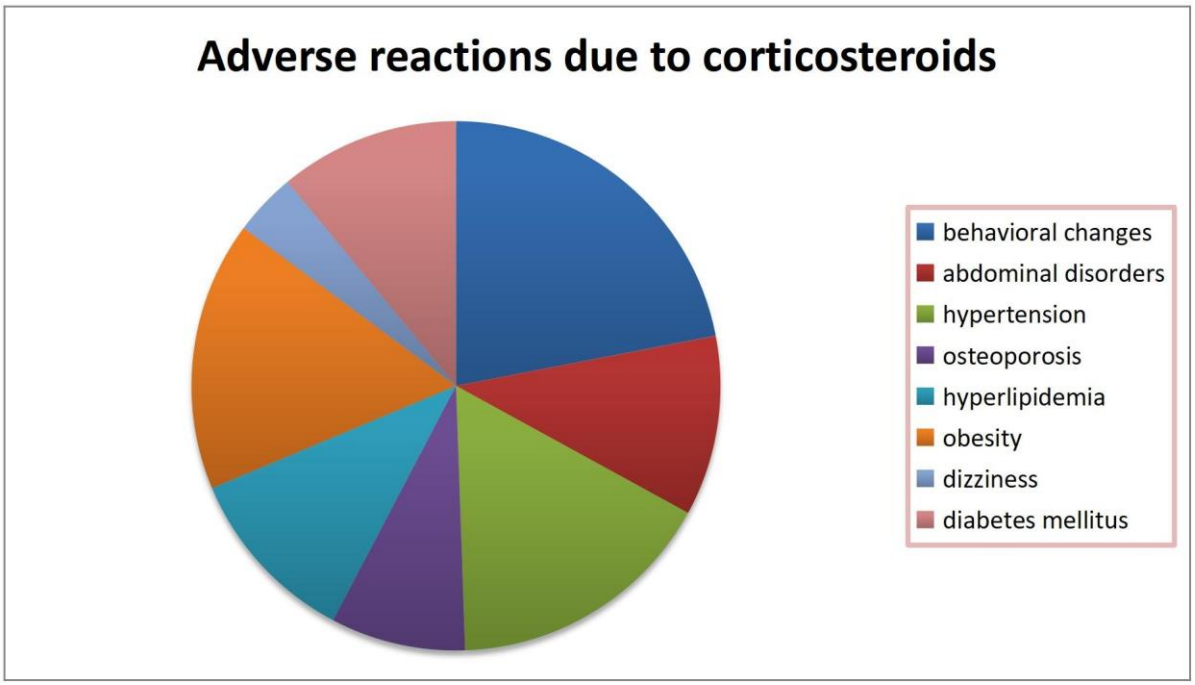
| Drug name | Generic name | Dose | ROA | Frequency | NO OF DAYS ADMITTED | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Inj.Magnex Forte | Cefoperazone1000mg + Sulbactam500mg | 0.1mg | ID | STAT | | | | | | | | | | | | | | |
| Inj.Dexa | Dexamethasone Sodium Phosphate | 4mg | ID | HS | ● | | | | | | | | | | | | | |
| Inj.Decadrone | Dexamethasone Sodium Phosphate | 8mg | IV | BD | | ● | ● | ● | ● | | | | | | | | | |
| Inj.Decadrone | Dexamethasone Sodium Phosphate | 6mg | IV | BD | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Inj.Pan | Pantoprazole ● | 40mg ● | IV ● | BD ● | | | | | | | | ● ● | ● ● | ● | ● | ● | ● | ● |
| Inj.Avil | Pheniramine Maleate | 2cc | IV | BD | | | | | | | | ● | ● | ● | ● | ● | | |
| Inj.Avil | Pheniramine Maleate | 2cc | IV | 1-1-1 | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| C.Becosules Z | B-Complex And Zinc ● | 1 Cap ● | PO ● | 0-1-0 ● | | | | | | | | ● ● | ● ● | ● | ● | ● | ● | ● |
| Inj.Linid | Oxazolidinone | 600mg | IV | 1-0-0 | | | | | | | | ● | ● | ● | ● | ● | | |
| T.Shelcal | Alfacidal ● | 500mg ● | PO ● | OD ● | | | | | | | | ● ● | ● ● | ● | ● | ● | ● | ● |
| D-Rise Sachet | Cholecalciferol | 1 | PO | | | | | | | | | ● | | | | | | ● |
| T.Azoram | Azathioprine | 50mg | PO | 0-0-1 | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Inj.Ibumedrol | Methylprednisolone | 125mg | IV | OD | | | | | | ● | ● | ● | ● | ● | ● | ● | | |

Cefoperazone is a 3rd generation cephelasporin and sulbactam is a antibiotic it was given to the patient as anti infective agent for skin infection. dexamethasone sodium phosphate is a adrenal glucocorticoid is given for allergic condition initial dose was 4mg and gradually increased due to the condition and slightly reduced to 6mg,pantoprazole as proton pump inhibitor, pheniramine maleate asanti-histamine, Oxazolidinone is a synthetic antibiotic , Azathioprine is a antirheumatic ,methyl prednisolone is a corticosteroid was given for 7 days (125mg ) by taking corticosteroids adrenal glucocorticoids this patients have Figure-1

complained of muscle weakness and alfacidal and vitamin d was given.even though this patients does not have history of any other medical conditions,she got unstablised CBG values it is refered in table-4.prednisolone is probably the treatment of choice until blister ceases.the dose is reduced according to the response and 0.5mg/kg/day.

**Adverse effects of medications**

Paients who are taking corticosteroids for long period of time should be monitored closely .patients might get any complications which is mentioned




From the below table it is said that this patient have steroid induced diabetes. guidelines on measuring blood sugar levels, rather than relying solely on symptoms, are only available for patients taking long-term glucocorticoids. According to the American Diabetes Association, the cutoff for diagnosing diabetes based on nonfasting plasma glucose levels is 200 mg/dL or higher in patients with classic symptoms of hyperglycemia such as polyuria and polydipsia.for the patients . Glucocorticoids have a direct influence on the insulin-mediated glycogen production and protein degradation and synthesis pathways. The majority of insulin-mediated glucose absorption occurs in skeletal muscle. Insulin attracts GLUT4 glucose transporters to the cell surface, allowing glucose to enter the cell. Glucocorticoids reduce insulin-mediated

glucose absorption by interfering directly with insulin signalling cascade components such as glycogen synthase kinase-3, glycogen synthase, and GLUT4 translocation. The suppression of post-insulin receptor cascades involving the PKB/Akt and mTOR pathways by glucocorticoids causes an increase in protein degradation and a decrease in protein synthesis. Glucocorticoids increase hepatic glucose production through decreasing the liver's sensitivity to insulin.They also reduce insulin sensitivity by up to 60% in healthy individuals by inhibiting glucose absorption in muscle and fat. This appears to be attributed mostly to a postreceptor action, i.e., suppression of glucose transport

Table-4 CBG Values :

| Date | Time | CBG VALUE | Before /after food | MEDICINE GIVEN |
|---|---|---|---|---|
| Day 6 | morning | 107mg/dl | After food | Gp 2 |
| Day 7 | morning | 131mg/dl | After food | GP2 |
| Day 8 | morning | 184mg/dl | After food | Volibo 0.2mg |
| Day 9 | morning | 202mg/dl | After food | Volibo 0.2mg |
| | evening | 149mg/dl | After food | nil |
| Day 10 | morning | 145mg/dl | After food | GP 2 |
| | afternoon | 246mg/dl | Before food | Volibo 0.2mg |
| | night | 257mg/dl | After food | GP 2 |
| Day 11 | morning | 90mg/dl | Before food | Gp 2 |
| | afternoon | 252mg/dl | After food | Volibo 0.2mg |
| | night | 150mg/dl | Before food | Gp 2 |
| Day 12 | morning | 113mg/dl | After food | nil |
| Day 13 | morning | 145mg/dl | After food | nil |
| | evening | 200mg/dl | After food | Gp2 |
| Day 14 | morning | 128mg/dl | Before food | GP2 |

**Discharge instruction**

Her vitals became stable ,doctor prescribed her glimepride 2nd generation sulfonylurea and voglibose as alpha-glucosidases inhibitors.she is adviced to take both class of drugs to stabilize her diabetes corticosteroids ,anti histamine,anti rheumatic ,clobetasol as topical corticosteroid ,antibiotic topical cream,tetracycline drug ,calcium and some vitamin supplements.

## Conclusion

Patient is gradually getting normal with the treatment , All adults receiving prednisone 2.5 mg or more daily for more than three months shall be encouraged to optimize calcium and vitamin D intake, and shall be counseled to quit smoking, have a balanced diet and be engaged in regular weight-bearing exercises, and limit alcohol intake to 1 to 2 alcoholic beverages in a day.The patient had bullous pemphigoid.the patient didn't the second dose of covid vaccine, bullous pemphigoid is characterized by tense ,sub-epidermal blisters on an erythematous base,eosinophilia and raised igE are present in approximately half the patients , antibodies are Ig G .the mechanism of bulla formation is thought to involve interaction between antoantibody, antigen, complement and leucocytes in a type II hypersensitivity reaction. retinoids ,ultraviolet rays may trigger the condition. treating them with corticosteroids is the best solution. all glucocorticoids increase gluconeogenesis .the turn over of glucose is increased ,more being metabolized to fat and blood glucose concentration is increased by 10 to 20 percentage.steroid-diabetes a benign diabetes without a tendency to ketosis ,only one-fifth of patients treated with high glucocorticoid dosages

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