

[Session1. 코로나 판데믹 이후 무엇이 달라졌나?]

# 코로나/독감 백신과 만성두드러기

예영민

아주의대 내과

## 코로나 / 독감 백신과 만성두드러기

2024.03.17

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예영민

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### Adverse Reactions to Vaccines

#### 1. AEs directly caused by vaccine components

- viral antigen and other vaccine components

#### 2. AEs d/t the host immune response

- Local inflammatory response: Ag/Adjuvants-TLR-induced inflammation
- Systemic inflammatory response: fever, irritability, vomiting, myalgia  
age, female, genetics, previous infection, increasing vaccine doses

#### 3. Allergic reactions

- Type I: 0.65 cases / million doses
- Type IV: peak between 72 and 96 h after vaccination (첨가제)

#### 4. Other immune-related reactions:

- 1/6000 measles, 1/3000 rubella, 1/30000 MMR vaccine

### Vaccine-associated hypersensitivity

- Risk of **anaphylaxis** after all vaccines is estimated to be

1.31 (95% CI, 0.90-1.84) per million vaccine doses.

- Trivalent inactivated influenza vaccine (TIV)-triggered anaphylaxis:

1.35 (95% CI, 0.65-2.47) per million vaccine doses.

- MIV-induced anaphylaxis: 1.83 (95% CI, 0.22-6.63)

- Almost any vaccine can cause anaphylaxis,

- additional component: egg (influenza), gelatin (MMR), alpha-gal (MMR, HZV),  
milk (DTaP)

- adjuvants: aluminum hydroxide, gentamicin, tetracycline, neomycin,  
streptomycin, polymixin B, thimerosal, 2-phenoxyethanol, phenol

## Allergic components in Vaccines

**Vaccine components → 과민반응 ←**

| 첨가제          |                |
|--------------|----------------|
| Egg proteins | Influenza vac. |
| Formaldehyde |                |
| Thimerosal   |                |
| Neomycin     |                |
| Gelatin      |                |
| Polysorbate  |                |
| PEG          |                |

## Components in COVID-19 Vaccines

| Pfizer      | Moderna                | AstraZeneca                  | Johnson & Johnson                |
|-------------|------------------------|------------------------------|----------------------------------|
| • mRNA      | • mRNA                 | • Adenovirus vector          | • Adenovirus vector              |
| • KCl, NaCl | • Acetic acid          | • Histidine                  | • Citrate monohydrate            |
| ♦ PEG-2000  | ♦ PEG-2000             | ♦ Mg(Cl) <sub>2</sub>        | ♦ Polysorbate 80                 |
| • Sucrose   | • Dimyristoyl glycerol | ♦ Polysorbate 80             | • 2-hydroxypropyl-B-cyclodextrin |
| • Saline    | • Cholesterol          | • Ethanol                    | • Ethanol                        |
|             | • Phosphocholine       | • Sucrose                    | • Sodium hydroxide               |
|             | • Sodium acetate       | • Disodium edetate dihydrate |                                  |
|             | • Sucrose              |                              |                                  |
|             | • Tromethamine         |                              |                                  |

*N Engl J Med 2021; 384:643-649*

## Viral infections associated with Urticaria

| Type of Urticaria     | Viral infection   |
|-----------------------|---|
| Acute urticaria       | Parainfluenza, Herpes virus(HHV-1, HHV-2, HHV6, EBV, CMV), Coronaviruses including SARS-CoV-2, Hepatitis A, B, C, Adenovirus, RSV, Dengue virus, VZV, Parvovirus, Rotavirus, Norovirus, Enterovirus |
| CSU                   | Hepatitis A, B, C, HSV, HHV-6, Norovirus, Parvovirus  |
| Cold urticaria        | HIV, EBV, HBV, CMV  |
| Cholinergic urticaria | SARS-CoV-2  |

*Viruses 2023;15:1585. <https://doi.org/10.3390/v15071585>*

## Trends in AEs following immunization in Korea

| Vaccines              | Neurologic reaction <sup>a</sup> |           | General systemic reaction <sup>a</sup> |           | Local reaction <sup>a</sup> |           | Allergic reaction <sup>a</sup> |           |
|-----------------------|----------------------------------|-----------|--|-----------|-----------------------------|-----------|--------------------------------|-----------|
|                       | aOR <sup>b</sup>                 | 95% CI    | aOR <sup>b</sup>                       | 95% CI    | aOR <sup>b</sup>            | 95% CI    | aOR <sup>b</sup>               | 95% CI    |
| Influenza             | 0.88                             | 0.83-0.93 | 0.95                                   | 0.91-0.99 | 1.32                        | 1.27-1.38 | 0.85                           | 0.77-0.92 |
| Rotavirus             | 2.43                             | 2.25-2.62 | 0.96                                   | 0.91-1.02 | 0.01                        | 0.01-0.01 | 1.46                           | 1.31-1.62 |
| Pneumococcal          | 0.62                             | 0.57-0.68 | 1.04                                   | 0.99-1.10 | 1.45                        | 1.37-1.53 | 0.77                           | 0.69-0.87 |
| HPV                   | 1.45                             | 1.34-1.57 | 0.90                                   | 0.86-0.96 | 0.75                        | 0.70-0.80 | 0.83                           | 0.71-0.97 |
| DTaP                  | 0.66                             | 0.59-0.74 | 1.07                                   | 0.99-1.16 | 1.29                        | 1.18-1.41 | 1.08                           | 0.93-1.24 |
| Meningococcal         | 1.41                             | 1.27-1.56 | 0.52                                   | 0.49-0.56 | 2.88                        | 2.63-3.16 | 0.37                           | 0.30-0.46 |
| Hib                   | 0.96                             | 0.86-1.08 | 1.29                                   | 1.18-1.41 | 0.66                        | 0.58-0.76 | 1.78                           | 1.55-2.03 |
| BCG                   | 0.07                             | 0.04-0.11 | 2.20                                   | 1.91-2.53 | 3.15                        | 2.69-3.68 | 0.17                           | 0.11-0.27 |
| Herpes zoster         | 0.73                             | 0.61-0.87 | 0.97                                   | 0.87-1.08 | 1.13                        | 1.01-1.26 | 0.63                           | 0.44-0.89 |
| Japanese encephalitis | 0.87                             | 0.72-1.05 | 1.36                                   | 1.18-1.56 | 0.29                        | 0.22-0.38 | 2.38                           | 1.98-2.87 |

generalized urticaria, anaphylactic reactions, allergy, hypersensitivity, etc

*Yonsei Med J. 2020;61:623-30*

## Adverse events following COVID-19 vaccination in South Korea

- A nationwide observational study (2021.02.28~ 2021.08.21)
- Incidence of adverse reactions after COVID-19 vaccinations was <1%.
- Pain (63.5%), myalgia (32.2%), headache (29.4%), GI symptoms (25.3%), skin-related (22.4%), neurologic (17.6%), and arthritis (1.9%)

Mortality events  
Anaphylaxis events  
Major severe AEs  
Mild AEs

Adverse events / 1,000,000 people

0 100 200 300 2,800 5,300

AZD1222 BNT162b2 mRNA-1273

0 1 2 3 4 5 6 7 Symptom onset period, day

0 1,000 2,000 3,000 4,000 5,000 6,000

0 1,000 2,000 3,000 4,000 5,000 6,000

Mild AEs Major severe AEs Anaphylaxis events Mortality events

*Int J Infect Dis 2022;118:173-82*

## Incidence of common cutaneous reactions related to COVID-19 vaccination

- A systematic review including 35 studies, 2549968 participants from 23 countries
- Overall systemic skin reactions: 3.8% (2.4%-5.5%)
- Urticaria** 1.1% (0.7%-1.5%)

Urticaria

Age groups

Mean/median age <50 years 8 1.8% (0.6%-3.5%) 90

Mean/median age ≥50 years 0 - -

Ethnic groups

Asia 6 2.9% (2.1%-3.7%) 40 <0.001<sup>d</sup>

North America 4 0.4% (0.2%-0.6%) 94 0.022<sup>d</sup>

Europe 4 0.6% (0.1%-1.4%) 79 0.285<sup>d</sup>

Vaccine types

mRNA vaccine 9 0.7% (0.4%-1.1%) 95 0.006<sup>d</sup>

Inactivated vaccine 2 4.0% (2.2%-6.1%) 0.094<sup>d</sup>

AVV vaccine 3 3.1% (1.8%-4.6%) 0.136<sup>d</sup>

Vaccine doses

The first dose 4 1.2% (0.5%-2.2%) 97

The second dose 3 1.0% (0.3%-1.9%) -

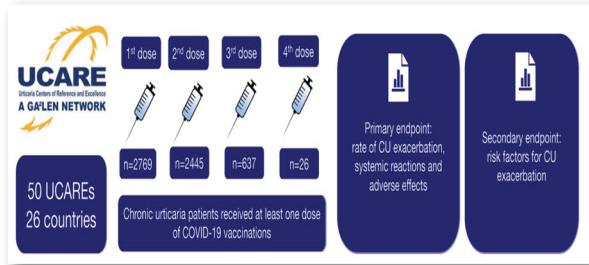
*J Glob Health 2023;13:06008*

## COVID-19 Vaccination as a Cause of AU

- A recent meta-analysis reported that cutaneous ADR after COVID-19 vaccination
- acute injection site reaction (72.2%), rash/eruption (13.8%), urticaria/angioedema (6.5%), pruritus (2.3%), delayed large local reactions (1.9%), maculopapular rash (0.5%), herpes zoster (0.4%), oral blister/ulcer (0.36%), pityriasis rosea (0.24%), vesiculobullous lesions (0.2%), petechia/purpura/ecchymosis (0.14%), and vasculitis (0.1%)**
- AU after COVID-19 vaccination most often occurs **after the 1<sup>st</sup> dose** and tends to **not recur with subsequent doses** (17% recurrence after 2<sup>nd</sup> dose, non-severe).
- mRNA-based** COVID-19 vaccines were found to have a higher prevalence (6.9%)
- Moderna (3.9%) and Pfizer (3.9%) vaccines have a lower incidence of urticaria compared to the flu (5.5%), and HBV (6.4%) vaccines.

Dermatologic Therapy. 2022;35:e15391

## CSU Exacerbation: COVAC-CU study

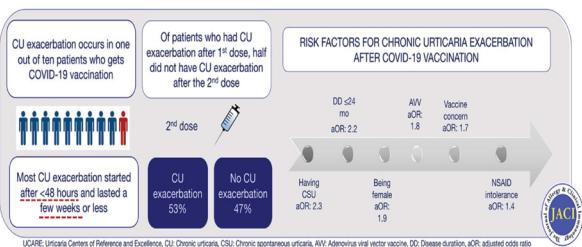


- An international multicenter **retrospective study** in CU patients >18 years and vaccinated with >1 dose of any COVID-19 vaccine
- 2769 COVID-19-vaccinated CU patients, 90% received at least 2 COVID-19 vaccine doses, and most patients had well-controlled disease

J Allergy Clin Immunol 2023;152:1095-106

## The UCARE COVAC-CU study

- First-dose vaccine-related adverse effects, most commonly **local reactions, fever, fatigue, and muscle pain**, were reported by 43.5% of CU patients
- The rate of COVID-19 vaccination-induced CU exacerbation was **9%**

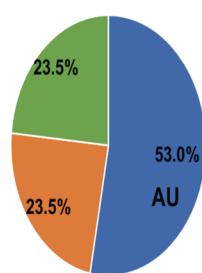


- Urticaria exacerbation: 8% ~ 15% of CU patients after COVID-19 vaccines *Dermatol Ther 2022, J Clin Med 2022*
- Relapse or exacerbation of urticaria in 7.7% of pediatric patients after COVID-19 vaccination *Allergol Immunop 2022*

J Allergy Clin Immunol 2023;152:1095-106

## 132 patients reported with urticaria after COVID-19 vaccination

- Using ADR report system from June 2021 to February 2022



| Variables  | AU (n=70)                            | CU (n=62)                            |
|--|--------------------------------------|--------------------------------------|
| Age (yr)   | 42.2 ± 17.6                          | 44.7 ± 13.5                          |
| Female   | 48 (68.6%)                           | 39 (62.9%)                           |
| Angioedema (+)   | 12 (17.1%)                           | 27 (43.5%)                           |
| mRNA-based V   | 50 (71.4%)                           | 47 (75.8%)                           |
| Adenovirus V   | 20 (28.6%)                           | 15 (24.2%)                           |
| 1 <sup>st</sup> / 2 <sup>nd</sup> / 3 <sup>rd</sup> dose | 44 (62.9%)<br>20 (28.6%)<br>6 (8.6%) | 33 (53.2%)<br>26 (41.9%)<br>3 (4.8%) |
| Treated with   |                                      |                                      |
| H1AH   | 66 (94.3%)                           | 61 (98.4%)                           |
| Steroid  | 60 (85.7%)                           | 50 (80.6%)                           |
| Omalizumab   | 0                                    | 11 (17.7%)                           |
| Latent period (days)                                     | 4.9 ± 6.6                            | 5.4 ± 14.3                           |

Chun HS, et al. KAAACI 2022

|  | New onset of CU (n=31)      | Exacerbation of existing CU (n=31) | P value |
|--|-----------------------------|------------------------------------|---------|
| Age (year)   | 45.0 ± 14.4                 | 44.5 ± 12.9                        | 0.882   |
| Female sex   | 18 (58.1%)                  | 21 (67.7%)                         | 0.430   |
| Pfizer-BioNTech  | 22 (71.0%)                  | 23 (74.2%)                         |         |
| Moderna  | 1 (3.2%)                    | 1 (3.2%)                           |         |
| Oxford-AstraZeneca   | 8 (25.8%)                   | 7 (22.6%)                          |         |
| after 1 <sup>st</sup> / 2 <sup>nd</sup> / 3 <sup>rd</sup> dose | 14 (45.2%) / 16 (51.6%) / 1 | 19 (61.3%) / 10 (32.3%) / 2        | 0.392   |
| Past Hx of allergic disease                                    | 14 (45.2%)                  | 11 (35.5%)                         | 0.437   |
| Interval between vaccination and symptom onset                 | 9.1 ± 19.5 (days)           | 1.7 ± 2.8 (days)                   | <0.001  |
| Angioedema   | 12 (38.7%)                  | 15 (48.4%)                         | 0.442   |
| Anaphylaxis  | 4 (12.9%)                   | 7 (22.6%)                          | 0.319   |
| Duration of symptom (days)                                     | 141.41 ± 62.2 (n=22)        | 72.48 ± 80.3 (n=23)                | 0.003   |
| OMA treatment for  | 6 (19.4%)                   | 3 (9.7%)                           |         |

Chun HS, et al. KAAACI 2022

Allergy Asthma Immunol Res. 2023 Sep;15(5):695-698  
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Allergy, Asthma &



Letter to the Editor

## A Case Series of Chronic Spontaneous Urticaria After COVID-19 Vaccination

| Pt. No. | Sex | Age | Covid-19 vaccine   | Latent period (day) | Duration till first visit (week) | CSU (week) | Number of CSU development | Allergic disease | Presence of angioedema | T IgE (IU/mL) | ANA | Anti-TPO | CRP (mg/L) |
|---------|-----|-----|--------------------|---------------------|----------------------------------|------------|---------------------------|------------------|------------------------|---------------|-----|----------|------------|
| 1       | M   | 41  | Pfizer-BioNTech    | 14                  | 5                                | 55         | 1                         | No               | Yes                    | 1,009         | Neg | Neg      | 3.6        |
| 2       | F   | 33  | Oxford-AstraZeneca | 3                   | 1                                | 52         | 1                         | Yes              | No                     | 128           | Pos | Neg      | 1.5        |
| 3       | F   | 51  | Pfizer-BioNTech    | 5                   | 2                                | 7          | 1                         | No               | Yes                    | ND            | ND  | ND       | ND         |
| 4       | F   | 39  | Pfizer-BioNTech    | 1                   | 1                                | 44         | 1                         | No               | No                     | 309           | Neg | ND       | 0.9        |
| 5       | F   | 48  | Pfizer-BioNTech    | 7                   | 3                                | 51         | 1                         | No               | No                     | 106           | ND  | ND       | 0.9        |
| 6       | F   | 46  | Pfizer-BioNTech    | 10                  | 5                                | 39         | 2                         | No               | Yes                    | 37            | Neg | ND       | 24.5       |
| 7       | M   | 48  | Pfizer-BioNTech    | 20                  | 12                               | 52         | 2                         | Yes              | Yes                    | 837           | Neg | Neg      | 11.0       |
| 8       | F   | 36  | Pfizer-BioNTech    | 7                   | 3                                | 38         | 2                         | Yes              | No                     | 154           | Neg | Neg      | 0.9        |
| 9       | M   | 56  | Pfizer-BioNTech    | 3                   | 6                                | 5          | 3                         | Yes              | No                     | 144           | Neg | Neg      | 0.9        |
| 10      | M   | 31  | Pfizer-BioNTech    | 14                  | 8                                | 12         | 1                         | Yes              | No                     | 788           | Neg | Neg      | 0.9        |
| 11      | M   | 42  | Pfizer-BioNTech    | 14                  | 26                               | 44         | 1                         | No               | Yes                    | 423           | Pos | Neg      | 0.9        |
| 12      | F   | 28  | Pfizer-BioNTech    | 5                   | 4                                | 50         | 1                         | Yes              | No                     | 160           | Neg | Neg      | 0.9        |

58.3%

Omalizumab treatment

### Effects of COVID-19 and Influenza Vaccination on Allergic Diseases

- Patients with allergic diseases who were diagnosed and followed up by allergy specialist were enrolled from 14 university hospitals in Korea.
- The 17 questionnaires about adverse reactions and exacerbation of underlying allergic disease after COVID-19 and influenza vaccines were answered.

➤ Among 1680 vaccinated patients with COVID-19, 286 (17%) experienced exacerbation of allergic disease.

Ban GY, et al. KAAACI Proc 2022;43:30-6

### COVID-19 Vaccination as a Cause of CU

| Group                   | n   | Approx. % | CSU in complete clinical remission for ≥ 6 months | Matched 1:2 for age and sex with CSU |
|-------------------------|-----|-----------|---|--------------------------------------|
| New onset CSU (n=27)    | 27  | ~5.4%     |   |                                      |
| Relapsed CSU (n=32)     | 32  | ~15.2%    |   |                                      |
| CSU control (n=179)     | 179 |           | 27.9%   |                                      |
| Healthy control (n=476) | 476 |           | 23.1%   |                                      |

▪ Allergic comorb: 70.4%      40.6%      27.9%      23.1%

▪ Multiple logistic regression analysis  
 ASST positivity 5.54 (2.36–13.02)  
 AR, BA, AD 6.13 (2.52–14.89)  
 Basopenia\* 2.81 (1.17–6.72)

\* < 100 cells/mL

A retrospective study from Jan 2020 to Aug 2021 in Israel. *Allergy Asthma Proc* 2022;43:30-6

### Clinical characteristics of patients with SARS-COV-2 vaccines-induced CU

| Characteristics  | SARS-COV-2 vac-induced CU (n = 57) | SARS-COV-2 vac-tolerant controls (n = 115) | OR, P value     |
|--|------------------------------------|--|-----------------|
| Age (years)  | 49.9 ± 16.5                        | 47.5 ± 15.1                                | 0.371           |
| Female (%)   | 39 (68.4%)                         | 64 (55.7%)                                 | 1.7 (0.9–3.4)   |
| Received vaccine   |                                    |  |                 |
| - AZD1222  | 13 (22.8%)                         | 27 (23.5%)                                 |                 |
| - mRNA-1273  | 34 (59.6%)                         | 40 (34.8%)                                 |                 |
| - BNT162b2   | 9 (15.8%)                          | 19 (16.5%)                                 |                 |
| Asthma, AR, AD, CU, Drug allergy, Food allergy – no significant difference |                                    |  |                 |
| Thyroid disease  | <b>5 (8.8%)</b>                    | 1 (0.9%)                                   | 11.0 (1.2–96.2) |
| Anti-TPO IgG Ab  | <b>16 (28.1%)</b>                  | 5 (4.3%)                                   | 8.6 (3.0–24.9)  |
| Total IgE >100   | <b>20 (35.1%)</b>                  | 12 (10.4%)                                 | 4.6 (2.1–10.4)  |
| D-dimer > 0.55   | <b>12 (21.1%)</b>                  | 6 (5.2%)                                   | 4.8 (1.7–13.7)  |
| ANA, CRP, TSH, WBC, Eosinophil, Basopil – no significant difference        |                                    |  |                 |

J Autoimmun 2023;138:103054

### Exacerbation of CSU following COVID-19 vaccination

- A questionnaire-based cross-sectional study in a tertiary hospital
- 105 CSU patients (230 vaccination cases) aged 18 to 80 years, who were regularly treated with omalizumab, had received at least one dose of COVID-19 vaccination and had no or mild CSU at the time of COVID-19 vaccination.
- 15 patients (14.3%) experienced a CSU exacerbation at least once after COVID-19
- Risk factors for CSU exacerbation:

Mild urticaria (vs none) before vaccination (OR 4.99; 1.57-15.82)

The presence of systemic reactogenicity (OR 4.57; 1.62-12.90)

| Risk Factor                                  | Odds Ratio | 95% CI      | Notes   |
|--|------------|-------------|---|
| Mild urticaria (vs none)                     | 4.99       | 1.57-15.82  |   |
| Systemic reactogenicity (Grade 1 vs absence) | 1.69       | 0.33-8.77   | "fever, chills, fatigue, myalgia, arthralgia, diarrhea, and headache" |
| Grade 2 vs absence                           | 6.12       | 1.92-19.52  |   |
| Grade 3 vs absence                           | 25.33      | 3.03-211.68 |   |

J Allergy Clin Immunol Pract 2023;11:2403-10

### Safety of COVID-19 mRNA vaccination in children with chronic urticaria

- From December 2021 to March 2022, 101 children aged 5 to 18 years from a registry of children with CU recruited from 3 allergy clinics in Canada and Israel.
- For both the first and second BNT162b2 doses, no patients reported any allergic reaction, including exacerbations of CU.
- A total of 17 patients (17%) had been infected with COVID-19, and 9 of them (53%) were unvaccinated at the time of infection.

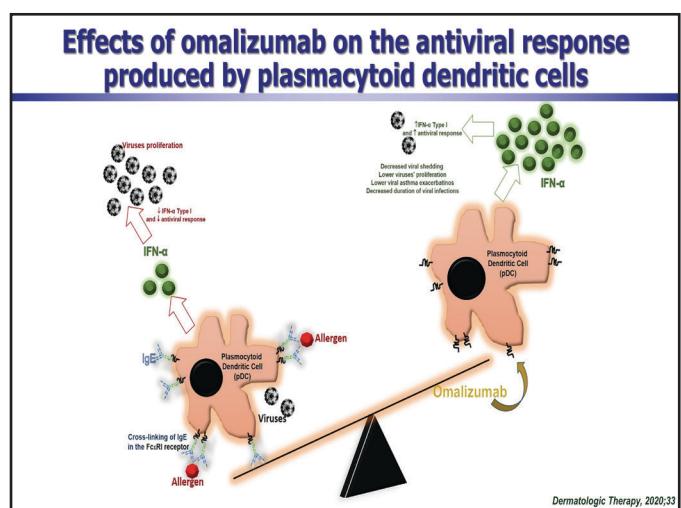
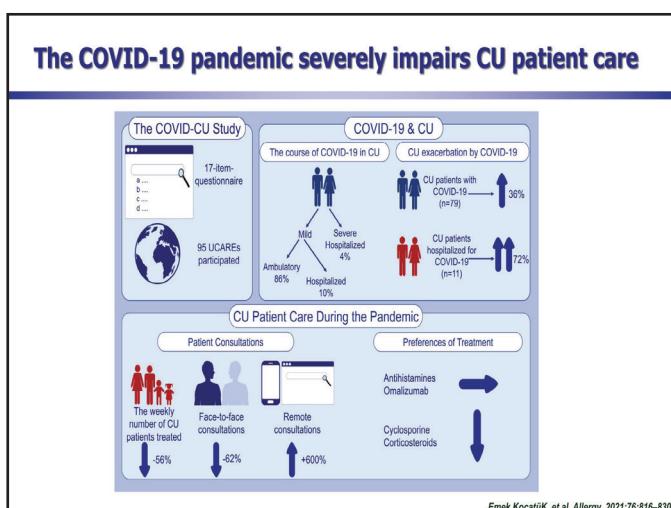
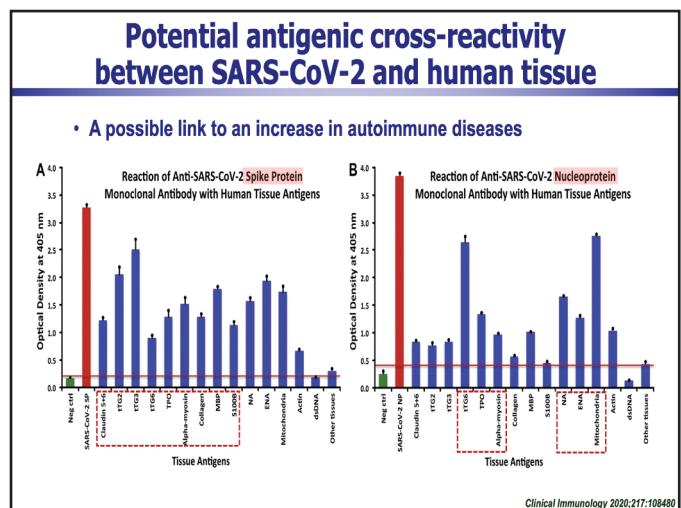
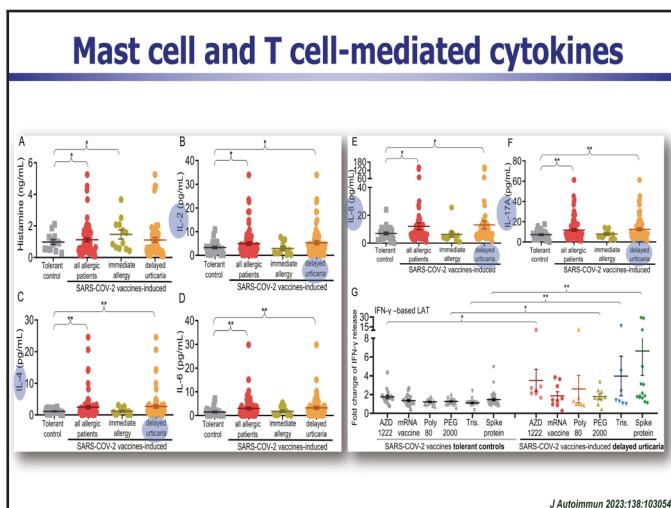
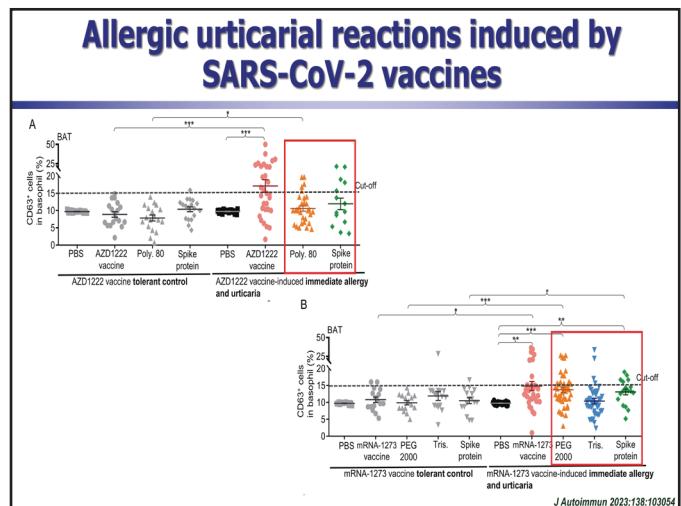
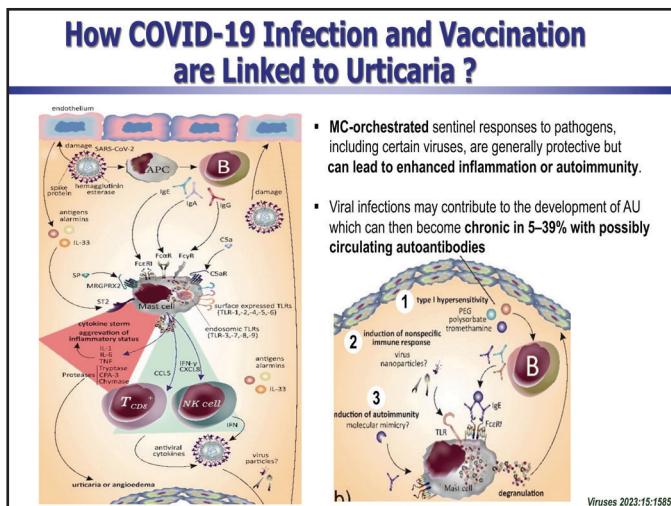
➤ Children with CU are at minimal risk of suffering from an allergic reaction secondary to COVID-19 vaccination.

➤ COVID-19 infection in children with CU does not precipitate a CU flare.

J Allergy Clin Immunol Pract 2023;11:1313

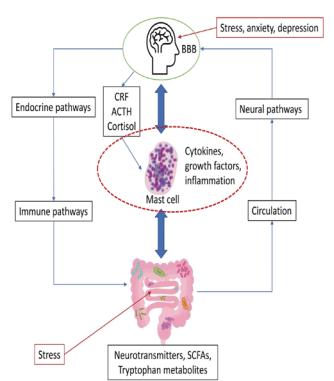
### Urticaria is a mast cell-driven disease

<img alt="Diagram illustrating the mast cell-driven mechanism of urticaria. It shows the interaction of IgE antibodies with FcεRI receptors on mast cells, leading to degranulation and release of mediators like Histamine, PGs, LTs, Tryptase, Proteoglycans, ILs, which cause symptoms like Puritus, Erythema, Edema. Other receptors shown include IgG anti-FcεRI, IgG anti-IgE, IgG anti-FcτRI, ST2, CRTH2, CSaR, MRGPRK2, IL-4R, IL-5R, IL-13R, IL-14R, IL-15R, IL-16R, IL-17R, IL-18R, IL-20R, IL-22R, IL-24R, IL-26R, IL-28R, IL-29R, IL-30R, IL-31R, IL-32R, IL-33R, IL-34R, IL-35R, IL-36R, IL-37R, IL-38R, IL-39R, IL-40R, IL-41R, IL-42R, IL-43R, IL-44R, IL-45R, IL-46R, IL-47R, IL-48R, IL-49R, IL-50R, IL-51R, IL-52R, IL-53R, IL-54R, IL-55R, IL-56R, IL-57R, IL-58R, IL-59R, IL-60R, IL-61R, IL-62R, IL-63R, IL-64R, IL-65R, IL-66R, IL-67R, IL-68R, IL-69R, IL-70R, IL-71R, IL-72R, IL-73R, IL-74R, IL-75R, IL-76R, IL-77R, IL-78R, IL-79R, IL-80R, IL-81R, IL-82R, IL-83R, IL-84R, IL-85R, IL-86R, IL-87R, IL-88R, IL-89R, IL-90R, IL-91R, IL-92R, IL-93R, IL-94R, IL-95R, IL-96R, IL-97R, IL-98R, IL-99R, IL-100R, IL-101R, IL-102R, IL-103R, IL-104R, IL-105R, IL-106R, IL-107R, IL-108R, IL-109R, IL-110R, IL-111R, IL-112R, IL-113R, IL-114R, IL-115R, IL-116R, IL-117R, IL-118R, IL-119R, IL-120R, IL-121R, IL-122R, IL-123R, IL-124R, 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## Long COVID and Chronic Urticaria

| Organ system     | Clinical symptoms   |
|------------------|---|
| Systemic         | Anaphylaxis, syncope, fatigue   |
| Dermatologic     | Flushing, skin rash, pruritus, urticaria  |
| Cardiovascular   | Hypotension, shock, chest pain, tachycardia   |
| Respiratory      | Wheezing  |
| Musculoskeletal  | Arthralgia, myalgia, degenerative disc disease, osteoporosis/osteopenia                           |
| Gastrointestinal | NV, abdominal pain, gastroesophageal reflux, diarrhea, esophagitis, malabsorption                 |
| Neurological     | Cognitive impairment, brain fog, dizziness, vertigo, migraine, paresthesia, peripheral neuropathy |



The diagram illustrates the complex triggers of Mast Cell Activation Syndrome. It shows a central mast cell surrounded by various factors: CRF, ACTH, Cortisol (Endocrine pathways); Cytokines, growth factors, inflammation; Immune pathways; Circulation; Neural pathways; and Stress (both internal and external). Arrows indicate the stimulation of the mast cell from these different sources.

*J Allergy Clin Immunol 2017;140:349-355*

*Asia Pacific Allergy 2023;13:50-3, Virol J 2022;19:158*

## Summary

- 바이러스 감염이 두드러기 (급성 > 만성)의 유발요인이 될 수 있다.
- COVID-19 백신 접종 후 만성두드러기 발생이 보고되었다.
  - 소아에서는 거의 없으며,
  - 성인에서는 1.1%, 기저 알레르기질환, 갑상선질환, ASST+, Basopenia, anti-TPO IgG, high IgE, high D-Dimer (potential risk)
- COVID-19 백신 접종 후 만성두드러기 악화가 보고되었다.
  - 8% ~ 15% of CU, incompletely controlled urticaria, systemic reactions, female, urticaria duration < 24 months, Adeno-viral vector
  - NSAID hypersensitivity
- COVID-19 백신 접종 후 만성두드러기 악화는 항히스타민제 증량, Omalizumab로 잘 치료
- 재접종 시 두드러기 악화의 반복 50% 정도이므로, 백신 접종을 기피할 필요 없다.
- 접종 전후 만성두드러기 유지치료가 COVID-19 감염 및 중증도에 영향을 미치지 않는다.