

Side Effects of the Covid-19 Vaccination Among Liberty University Students

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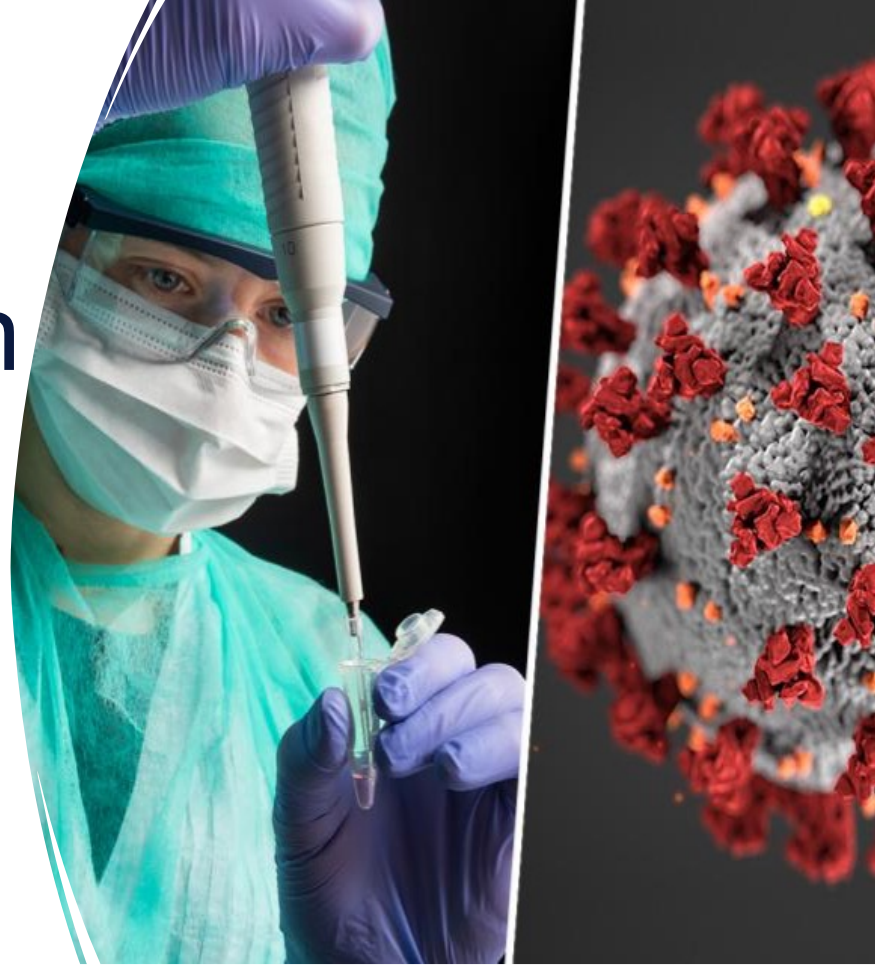


Fig.1 Commissioner, Office of the. "Coronavirus Disease 2019 (COVID-19)." *FDA*, FDA, 14 Mar. 2023, <https://www.fda.gov/emergency-preparedness-and-response/counterterrorism-and-emerging-threats/coronavirus-disease-2019-covid-19>
Accessed March 14, 2023

Background

Millions of Americans received COVID-19 vaccine.

Virginia Dept. of Health: 75.9% ages 18-24 yrs vaccinated at least 1 dose.

Many also report side effects from vaccine

Some report staying home from work/school due to complications from the vaccine, including young adults.

Background

Substantial number young adults not vaccinated in Lynchburg, VA

1/2 vaccine hesitant respondents report fear of side effects

Some believed contracting COVID-19 virus more tolerable than receiving vaccine

Study Aim

To assess the prevalence & severity of self-reported symptoms in university students who received both doses Covid-19 vaccine.

Literature Review

Inclusion criteria

- Peer-reviewed human studies
- Symptoms, signs/ laboratory parameters of patients at post-COVID-19 vaccine

Exclusion criteria:

- Not written in English
- Less than 100 participants



Fig.. 2 COVID-19 Vaccine Side Effects: What You Should Know | Fox Chase Cancer Center - Philadelphia PA. 19 Feb. 2021, <https://www.foxchase.org/blog/covid-19-vaccine-side-effects-what-you-should-know>
Accessed March 14, 2023

Symptoms

Symptoms after 1st dose

- Swelling/pain at injection site
 - Low fever
 - Headaches
 - Muscle pain
 - Mild myocarditis
 - Fatigue
- Most symptoms resolved within days of 2nd dose



Fig.3 Skerrett, Patrick. "When a Covid-19 Vaccine Becomes Available, Who Should Get It First?" STAT, 23 May 2020, <https://www.statnews.com/2020/05/23/when-a-covid-19-vaccine-becomes-available-who-should-get-it-first/>
Accessed March 14, 2023

Methods

Cross-sectional study

- Created a survey based on literature review/ previous studies
- Prevalence + severity side effects - Covid-19 vaccine among young university adults
- Screened vaccination status: **Both doses** Moderna or Pfizer vaccine/ present CDC passport
- In-person survey: demographic info., Covid-19 vaccine side effects evaluate self-reported severity, duration, & dose
- All analyses in SPSS 28.

Eligibility

- 18 - 25 years old
- Enrolled full-time - university/ college when vaccinated & currently
- Received both doses Moderna / Pfizer vaccine, 2nd dose > two weeks prior
- Presented CDC Vaccine Passport
- Speak / Read English

Table 1. Descriptive statistics (N=103).

Demographics		
Age (m, SD)		21.7 ± 2.1
Vaccine (n,%)		
	Pfizer	72 (69.9%)
	Moderna	31 (30.1%)
Sex:	Female	61 (59.2%)
Race:	White	65 (63.1%)
	Asian	19 (18.4%)
	Black	11 (10.7%)
	Hispanic	7 (6.8%)
Work Status		
	Full-Time Student-Only	46 (44.7%)
	Work Full-Time	19 (18.4%)
	Work Part-Time	38 (36.9%)
Marital Status		
	Single	98 (95.1%)
	Married	5 (4.9%)

Table 2. Symptoms from vaccine survey (N=103).

Symptoms	Yes (N, %)
Arm:	
Swelling	33 (32%)
Redness	28 (27.2%)
Soreness	93 (90.3%)
Fever	37 (35.9%)
Headache	52 (50.5%)
Chills	50 (48.5%)
Muscle Pain	68 (66%)
Joint Pain	17 (16.5%)
Tiredness/ Fatigue	79 (76.7%)
Nausea & Vomiting	9 (8.7%)
Swollen Lymph Nodes	9 (8.7%)

Results: Symptoms

Severely Reported >5 (Scale 1-10: 10 severe) N,%

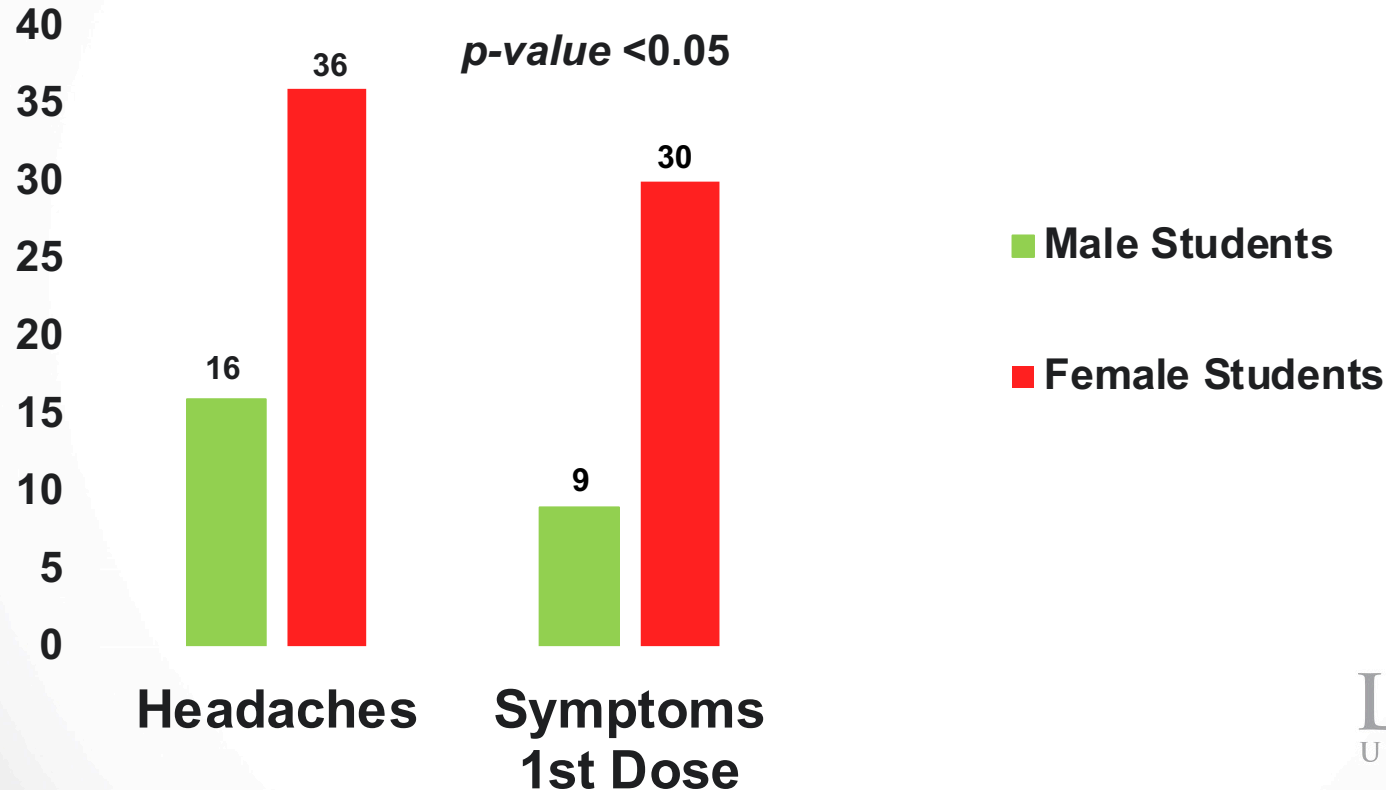
- ☐ Arm soreness (42, 41%)
- ☐ Muscle Pain (29, 28%)
- ☐ Tiredness/ Fatigue (34, 33%)

Results

Longest Lasting (24-72 hrs+) N,%

- Arm soreness (54, 53%)
- Headaches (18, 17%)
- Chills (19, 18.4%)
- Muscle pain (35, 34%)
- Tiredness/ Fatigue (39, 38%)

Figure 1. Female students reported more headaches overall ($p=0.037$; 95% C.I. 0.000, 0.140) and greater symptoms after 1st dose ($p=0.004$; C.I. 0.009, 0.193).



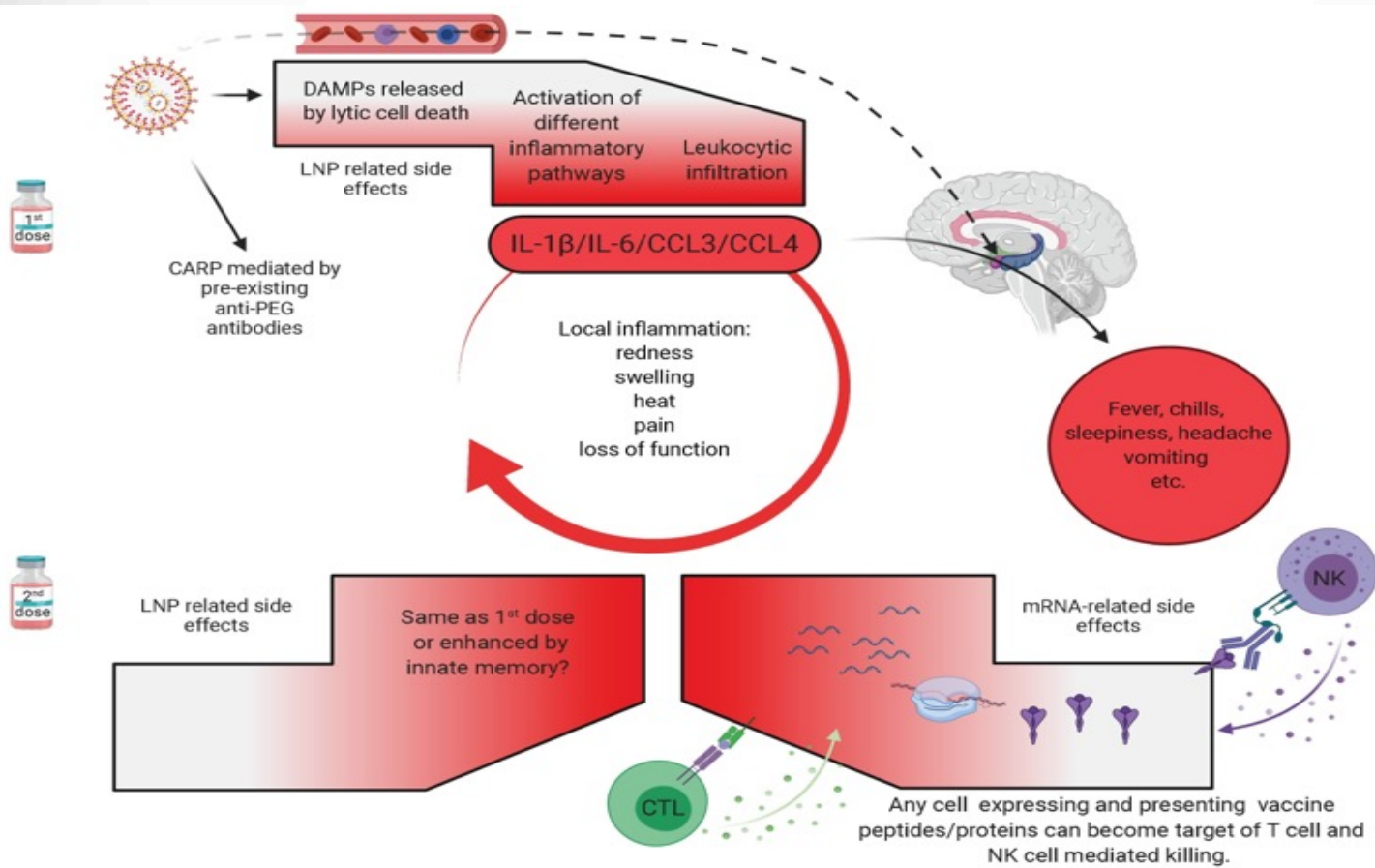



Fig.4 "Research Looks at Inflammatory Nature of Lipid Nanoparticle Component in mRNA Vaccines." *News-Medical.Net*, 15 Mar. 2021, <https://www.news-medical.net/news/20210315/Research-looks-at-inflammatory-nature-of-lipid-nanoparticle-component-in-mRNA-vaccines.aspx>
 Accessed March 14, 2023

Discussion

- Previous studies: women more likely to report > symptom-load from vaccine than men.
- Female sex-hormone levels may  antibody response.
- Laboratory research: female subjects elicited higher antibody titers to vaccine than male subjects in human studies.
- Lower dose vaccine may benefit female students.

Limitations

- Based on self-reported symptoms: no bloodwork to determine antibody levels/response to vaccines.
- Cross-sectional – single time point, therefore unable to establish temporality or change in symptom reporting over time.

Conclusion

Most common reported side effects: arm soreness, muscle pain, and fatigue/tiredness in university students.

Female students reported more symptoms with greater severity than male students.



Fig. 5 COVID-19 Vaccine Side Effects.
<https://www.who.int/mongolia/multi-media/item/covid-19-vaccine-side-effects> Accessed March 14, 2023

Conclusion

More research is needed on sex-based differences in vaccine /antibody response in young adults.

Female patients may benefit from lower dose vaccines.

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