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Disease Profile of COVID-19 and Risk Factors Associated with Severity of the Disease in Vaccinated Patients

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Introduction

Vaccine to prevent SARS-CoV-2 infection is considered the most promising approach for restraining the COVID-19 pandemic. COVID-19 vaccines provide strong protection against serious illness, hospitalization and death. There are also some evidences, that vaccinated people transmit the disease less than the non vaccinated ones.

Objectives

This study aimed to find out

- **The disease profile of COVID-19 in fully vaccinated patients.**
- **Risk factor associated with severity of COVID-19 in vaccinated patients.**

Inclusion criteria

- **Age \geq 18 year**
- **Completion of 2 doses vaccine**
- **COVID-19 positive by RT-PCR after at least 7 (seven) days of 2nd dose**
- **Patients attending inpatient and outpatient department**

Exclusion criteria

- **Age < 18 years**
- **COVID-19 positive within 7 days of 2nd dose of vaccine**
- **Partially vaccinated patients**
- **Incomplete information**

Methods

A cross-sectional study was carried out from June 2021 to August 2021 in COVID-dedicated hospitals of Dhaka. Total 169 RT-PCR positive adult patients were enrolled by a purposive sampling method. Disease profile and severity were identified according to the WHO guideline.

Statistical analysis

The Baseline characteristics of the study participants were described in frequency and percentage for categorical variables. Continuous variables with normal distribution were expressed as mean & standard deviation (SD). Group comparisons of parametric data were conducted using the independent sample t-test. Difference between two categorical data were analyzed by Chi-square test/ Fisher's exact test.

Statistical analysis.....cont.

Logistic regression was done to identify risk factors for developing severe disease by enter method. Data are expressed as odds ratio (OR) and 95% confidence interval (CI). SPSS Statistics 25.0 was used for the statistical analyses.

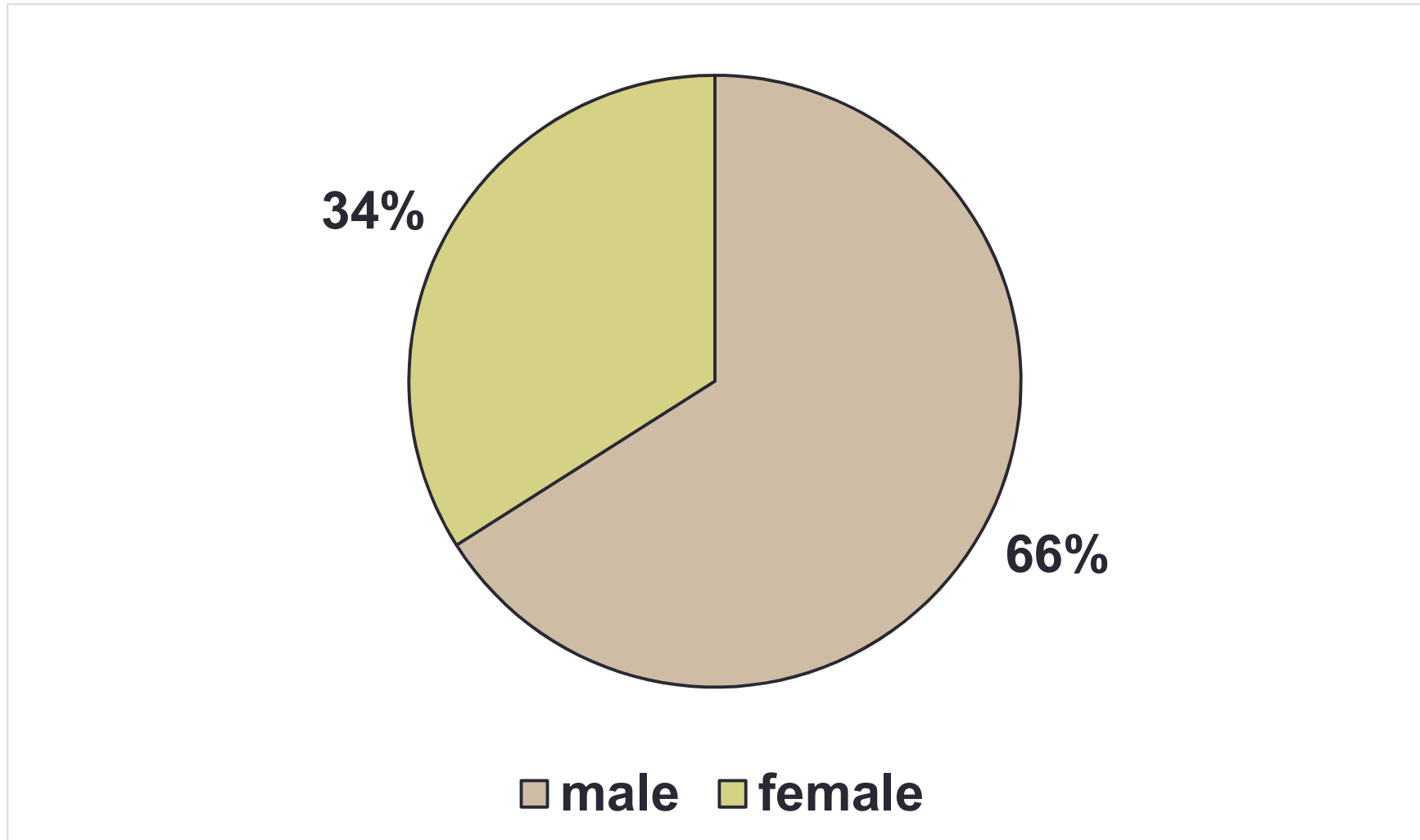


Result and Discussion

Demographic characteristics of the patients (n= 169)

Age in years	Number of patients (n=169)
Mean age (\pm SD)	50.46 (\pm 14.03)
18-39	53(31%)
40-59	55(33%)
\geq 60	61(36%)

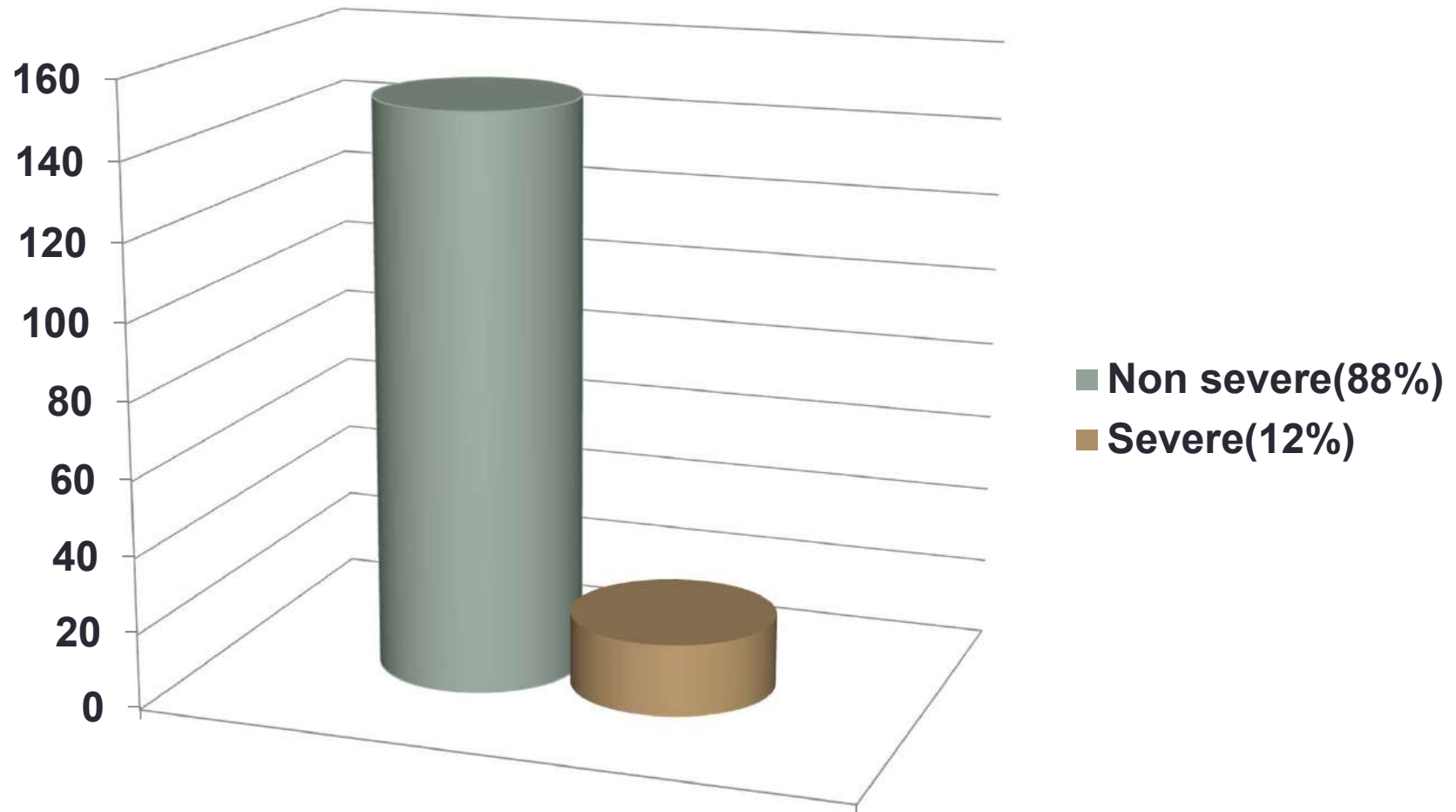
Gender distribution



Disease profile

Disease category	Frequency (%)
Mild	126 (75%)
Moderate	24 (14%)
Severe	15 (9%)
Critical	4 (2%)
Response	
Recovery	161 (95%)
Death	8 (5%)

Disease severity



Baseline characteristics of the post-vaccinated COVID-19 patients

Variables	Total patients (n=169)	Non-severe disease (n=150)	Severe/critical disease (n=19)	p-value
Age (Mean \pm SD)	50.46 (\pm 14.03)	48.91 (\pm 13.86)	62.63 (\pm 8.27)	<0.0001
Elderly (\geq 60 years)	61(36.1%)	47 (31.3)	14 (73.7)	<0.0001
Male gender	111 (65.7)	94 (62.7)	17 (89.5)	0.02

Co-morbidities	Total patients (n=169)	Non-severe disease (n=150)	Severe/critical disease (n=19)	p-value
DM, n (%)	71 (42)	53 (35.3)	18 (94.7)	<0.0001
HTN, n (%)	77 (45.6)	64 (42.7)	13 (68.4)	0.034
OAD, n (%)	19 (11.2)	14 (9.3)	5 (26.3)	0.044
IHD, n (%)	25 (14.8)	16 (10.7)	9 (47.4)	<0.0001
CKD, n (%)	71 (4.1)	2 (1.3)	5 (26.3)	<0.0001

Risk factors analyses for severe COVID-19 in study population (n=169)

Variables	Univariate analyses		
	cOR	95%CI	p-value
Elderly (≥ 60 years)	6.14	2.09-18.03	0.0001
Male gender	5.06	1.13-22.74	0.02
DM	32.94	4.28-253.69	0.0001
HTN	2.91	1.05-8.07	0.034
OAD	3.47	1.09-11.07	0.044
IHD	7.54	2.67-21.31	0.0001
CKD	26.43	4.69-148.92	0.0001

Risk factor analyses in regression model

Variables	Multivariate analyses		
	aOR	95%CI	P-value
DM	13.9	1.5-130.1	0.021
OAD	7.9	1.2-50.1	0.03
IHD	7.4	1.6-34.4	0.011
CKD	41.9	2.6-667.4	0.008

Key points of the result

- **12% of vaccinated people had severe disease.**
- **Risk factors associated with severe disease were DM, IHD, OAD, CKD.**

Comparison

Name of the study	Disease severity	Risk factors for severe disease
Present study	12%	DM, IHD, OAD, CKD
USA based study (Yek C et al)	9%	Elderly, immunosuppressed patients, CKD, liver disease, neurological disease, cardiac disease, pulmonary disease

Limitations

- **The limitation of our study is that it is a cross sectional study with a small sample size.**
- **We cannot be certain that we have identified all potential confounding factors.**

Conclusion

Vaccines against COVID-19 are showing a significant decrease in severe disease. However, vaccinated persons who are elderly, have underlying co-morbidity should receive intervention to control the chronic disease, prevent exposure, additional booster dose, and effective pharmacotherapy to mitigate risk factors.

References

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Yek C, Warner S, Wiltz JL, et al. Risk Factors for Severe COVID-19 Outcomes Among Persons Aged ≥ 18 Years Who Completed a Primary COVID-19 Vaccination Series — 465 Health Care Facilities, United States, December 2020–October 2021. *MMWR Morb Mortal Wkly Rep* 2022;71:19–25. DOI: <http://dx.doi.org/10.15585/mmwr.mm7101a4external icon>.



THANK YOU