ISSN: 2091-2749 (Print)
2091-2757 (Online)

Outcome of COVID-19 Infection in vaccinated and unvaccinated adults admitted to Patan Hospital, Nepal

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Abstract

Introduction: The vaccine has a positive impact on reducing the severity of the COVID-19 disease course and studies have projected 50-90% protection against severe disease. Our study aimed to find the difference in disease severity outcomes between RT-PCR positive vaccinated and unvaccinated individuals.

Method: This cross-sectional study was carried out among 417 COVID-19 cases who were admitted from June 2021 to August 2021. Collected data were fed into Microsoft-excel and analyzed using SPSS software, version-16.0. Frequency, percentage, mean and standard deviation were calculated for descriptive analysis. To find out the association of categorical variables, the Chi-square test or Fisher's Exact test was used where appropriate. P-value <0.05 was considered significant.

Result: Out of 417 cases, 23(5.5%) were fully vaccinated i.e. 10(2.4%) with Covishield and 13(3.1%) with Vero Cell, 48(11.5%) partially vaccinated i.e. 19(4.6%) with Covishield, and 29 (6.9%) with Vero Cell and 346(83%) unvaccinated. 343(82.25%) admitted patients were discharged and 74(17.75%) died during our study period. The disposition of the patient was statistically significant (p<0.001) and revealed more mortality among unvaccinated cases. There was a statistical difference between the requirement of ICU admission (p=0.032) among vaccinated and unvaccinated cases. The Absolute Risk Reduction (ARR) of mortality and requirement of ICU after complete vaccination with respect to unvaccinated COVID-19 patients was 14.11%(5.14%-23.73%) and 20.50%(8.02%-32.97%) respectively at 95% CI.

Conclusion: Vaccination reduces Mortality, the requirement of ICU, and oxygen requirement among COVID-19 cases with respect to unvaccinated COVID-19 cases.

Keywords: COVID-19, Covishield, outcome, unvaccinated, vaccinated, Vero Cell

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Submitted
11 Apr 2022

Accepted
24 Aug 2022

How to cite this article
John Shrestha, Mukesh Kumar Sah, Bishnu Mohan Singh, Nishan Upreti, Sujina Maskey, Ashish Jha, et al. Outcome of COVID-19 Infection in vaccinated and unvaccinated adults admitted to Patan Hospital, Nepal. Journal of Patan Academy of Health Sciences. 2022Aug;9(2):8-17.

https://doi.org/10.3126/jpahs.v9i2.49042

Introduction

Till the end of September 2021, WHO estimates a total of 5,874,934,542 vaccine doses have been administered globally against COVID-19.[1] Currently, against COVID-19, 53 different vaccines are in pipeline of development, while among them 8 vaccines are fully approved by different authentic bodies.[2] Different international studies have projected 50-90% protection against it.[3–8] Studies of Southeast Asia have shown promising reports with the Astrazeneca-Covishield vaccine with 60-93% protection against severe disease. However, studies regarding the efficacy of Vero Cell vaccines are still ongoing.[9-13] Nepal started its vaccination drive with Covishield, a replication-deficient Chimpanzee Adenovirus-vectored vaccine (Chad-Ox1-nCOV-19) followed by the Sinopharm -inactivated Vero cell vaccine,[14] both vaccines are almost equally covered in Nepal by till August 3, 2021. About 0.47 million people were vaccinated with Covishield and almost 0.7 million people with the Vero cell vaccine till the end of March 2022.[1,15,16] Around 14.04 million doses of vaccines have been given and around 6.3 million people have received the two dosages of Covishield or Vero cell vaccine[17] Thus, our study aimed to find the difference in disease severity outcomes of RT-PCR positive between vaccinated and unvaccinated individuals.

Method

A cross-sectional study was conducted at Patan Academy of Health Sciences during the surge of the second wave of COVID-19 in Nepal that is between June to August 2021. COVID-19 patients above 18 years were enrolled in the study whereas patients who had fewer than 28 days between vaccination of the first dose and hospitalization (time required to develop vaccine-induced protection), patients living in long-term care facilities, and patients who were referred or shifted to another center without completing treatment were excluded from the study. During this study design prevalence of ICU admission in the admitted patient who was vaccinated was not known so a prevalence of 50% was taken for the calculation of sample size. Sample size was calculated using the formula n = [DEFF*Np(1-p)]/ [$(d^2/Z^2_{1-\alpha/2}$*(N-1) +p*(1-p)]. So the total sample size estimated was 384 at a 95% confidence interval, 5% was added for possible loss of data or exclusion therefore, the total sample size considered for the study was 402.

The study was carried out after the ethical approval of this study by IRC-PAHS (Ref. No.: drs2105311530). A research registry with the unique identification number "researchregistry6918" was also received before conducting this study. Helsinki's ethical principle was followed during the study process. Data were collected using the digital Google form based on the proforma by the researchers on duty after taking consent from the patient or patient's attendant and the details regarding severity outcome were filled by the researchers at COVID ICU, HDU, and ward.

Independent variables like socio-demographic variables which include age, gender, and address were considered for this study. The age of the patients was categorized as 18-30, 31-40, 41-50, 51-60, and ≥60 years. Gender was categorized as Male and Female. The address was categorized according to province, from province 1 to province 7. Other independent variables included the Time since the vaccination dose was completed, Symptoms of COIVD 19 patients, and Comorbidities. Time since the vaccine dose was completed, was categorized as 4-5 weeks and >6 weeks among the vaccinated cases. Symptoms of the COVID-19 patient were categorized as shortness of breath (SOB), fever, cough, myalgia, vomiting and loss of taste or/and smell, loose stool, and all other symptoms of COVID-19 were considered in the category- others. Regarding co-morbidities, the category was Hypertension (HTN), Diabetes Mellitus (DM), Chronic Kidney Disease (CKD), Heart Disease, Chronic Obstructive Pulmonary Disease

(COPD), Hypothyroidism, and all other co-morbidities in the category others. Further, the other independent variable, duration of illness before presenting to COVID units was categorized as ≤3 days, 4-7 days, and >7 days. Oxygen requirement was categorized as <5 lit/min, 6-10 lit/min, and >10 lit/min, and none for those who did not require oxygen during treatment. The outcome characteristics like disposition were categorized as discharged and mortality occurred, similarly, length of hospital stay was categorized as ≤3 days, 4-7 days, 8-14 days, and >14 days. Another outcome characteristic need of ICU admission was categorized as required and not required. The dependent variable Vaccine status was categorized as Vaccinated (who have received both doses of either of Covishield or Vero cell vaccine) and Partially Vaccinated (who have received only one dose of either of Covishield or Vero cell vaccine) and Unvaccinated (not vaccinated at all). The type of vaccine considered was Covishield and Vero Cell. Disease severity was categorized as mild, moderate, and severe based on the patient's symptoms, oxygen saturation, the requirement of oxygen to maintain saturation (SPO_2) of a minimum of 94%, and the need for the area of admission.[18]

The data were analyzed using SPSS software, version 16.0. As data were normally distributed, frequency, percentage, mean and standard deviation were calculated for descriptive analysis. To find out the association of categorical variables, the Chi-square test or Fisher's Exact test was used where appropriate. A P-value less than 0.05 was considered statistically significant.

Result

A total of 417 patients aged 18 years and older hospitalized with SARS- COV2 virus admitted to the COVID Facility at PAHS were included in the study, out of which 240(57.6%) were male and 177(42.4%) were female with a male: female ratio of 1.35. Most of the patients [149 (35.7 %)] were of age group >60 years with a mean age of 53.79 years and 381(91.4%) residing in Province 3 None of the COVID-19 patients were from Provinces 6 and 7 which is the westernmost region of Nepal. Of the 417 patients, 23(5.5%) were fully vaccinated i.e. 10(2.4%) with Covishield and 13(3.1%) with Vero Cell, Table 1. Among the fully vaccinated 16 (3.8%) were vaccinated within 4-5 weeks and 7(1.7%) were vaccinated for more than 6 weeks. Regarding presenting symptoms of respondents, most of them 316(75.8%) presented with fever followed by 277(66.4%) with shortness of breath, 203(48.7%) with cough, 44(10.6%) with myalgia, 24 (5.8%) with loose stool, 19 (4.6%) with vomiting, 4 (1.0%) with loss of taste or/and smell and 31 (7.4%) had symptoms others than above mentioned like dizziness, abdominal pain, throat irritation, generalized weakness, and hemoptysis. For most of the patients, 255 (61.2%) presented with 4-7 days of illness. Mean days of illness 5.59±2.91. Of the 417 patients 123(29.5%) had Hypertension, 63(15.1%) had Diabetes mellitus, 11(2.6%) had CKD, 20(4.8%) COPD, and 37(8.9%) had other comorbidities.

Table 1. Patient's status of COVID-19 vaccination at the time of admission to COVID-19 facility (N=417)

Characteristics	Category	Subcategory	N	%
Vaccination Status	Vaccinated	-	23	5.5
	Partially Vaccinated	-	48	11.5
	Unvaccinated	-	346	83.0
Vaccine Type Among Vaccinated (71)	Vaccinated (23)	Covishield	10	14.1
		Vero Cell	13	18.3
	Partially Vaccinated (48)	Covishield	19	26.8
		Vero Cell	29	40.8
Time since vaccine dose completed (23)	4-5 weeks		16	3.8
	⩾6 weeks		7	1.7

A total of 343 (82.25%) patients were discharged and 74 (17.75) died during our study period. The disposition of the patient was statistically significant with a p-value of <0.001 among vaccinated and unvaccinated patients (Table 3). Among the vaccinated cases, only 4.3% died whereas among unvaccinated cases 18.8% died. Similarly, among partially vaccinated cases (N=48), 8 (16.7%) mortality was seen, Table 3. Among the different vaccine statuses of respondents, there was no significant difference between male and female patients as well as the type of vaccine and length of hospital stay with a p-value of 0.588, 0.734, 0.875 but with different age groups, it was statistically significant (p<0.001), Table 2 and 3. There was a statistical difference between the requirement of ICU admission (p=0.032) among vaccinated and unvaccinated patients and the ICU requirement is more among unvaccinated cases. Among the vaccinated cases, only 8.7% required ICU whereas among unvaccinated cases 29.2% were admitted to ICU. Similarly, among partially vaccinated cases (N=48), 10(20.8%) required ICU admission, Table 3.

Table 2. Association of Vaccination status with demographic, vaccine, symptoms, and treatment characteristics of the patient admitted to COVID-19 facility (N=417)

Characteristics	Category	Vaccine Status			p-value
		Vaccinated 23 N(%)	Partially Vaccinated 48 N(%)	Unvaccinated 346 N(%)	
Disease Severity	Mild	13(56.5)	17(35.4)	101(29.2)	0.018*
	Moderate	10(43.5)	26(54.2)	181(52.3)	
	Severe	0(0)	5(10.4)	64(18.5)	
Age of respondents	18-30	2(8.7)	1(2.1)	34(9.8)	**<0.001***
	31-40	3(13.1)	1(2.1)	65(18.8)	
	41-50	6(26.1)	4(8.3)	59(17.1)	
	51-60	5(21.7)	8(16.7)	80(23.1)	
	>60 Years	7(30.4)	34(70.8)	108(31.2)	
Gender	Male	11(47.8)	29(60.4)	200(57.8)	0.588**
	Female	12(52.2)	19(39.6)	146(42.2)	
Type of Vaccine	Covishield	10(43.5)	19(39.6)	-	0.734**
	Vero Cell	13(56.5)	29(60.4)	-	
Admitted area	COVID-Ward	18(78.3)	22(45.8)	168(48.6)	**0.049***
	COVID-HDU	4(17.4)	19(39.6)	108(31.2)	
	COVID-ICU	1(4.3)	7(14.6)	70(20.2)	
Oxygen Requirement (Liter/Minute)	<5 lit/min	11(47.8)	29(60.4)	148(42.8)	**0.012***
	6-10 lit/min	4 (17.4)	9 (18.8)	90 (26.0)	
Median (Q1-Q3)=6 (3-10)	>10 lit/min	0 (0)	5 (10.4)	61 (17.6)	
	None	8 (34.8)	5 (10.4)	47 (13.6)	

*Test Applied is fisher's exact test at 95% CI; **Test Applied is Chi-square test at 95% CI; statistically significant (p<0.05); vaccinated received two doses, partially vaccinated received one dose

Similarly, 108(31.2%) unvaccinated patients were admitted to COVID HDU, versus 4(17.4%) fully vaccinated and 19(39.6%) partially vaccinated, and 168(48.6%) unvaccinated patients were admitted to the COVID ward versus 18(78.3%) fully vaccinated and 22(45.8%) partially vaccinated with a p-value of 0.049 among vaccinated and unvaccinated patients, Table 2. Unvaccinated patients had a severe illness in 64 (18.5%) and vaccinated had mild severity in 13(56.5%). Among the partially vaccinated 17(35.4%) had mild, 26(54.2%) moderate, and 5(10.4%) severe disease. Disease severity among vaccinated and unvaccinated patients was statistically significant, p=0.018, Table 2. Oxygen requirement was more in unvaccinated patients versus vaccinated patients which was statistically significant (p=0.012).

Table 3. Association of vaccination status with the outcome of the patient admitted to COVID-19 facility (n=417)

Characteristic	Category	Vaccine Status (n=417)			Row total N(%)	p-value	Remarks
		Vaccinated 23 N(%)	Partially Vaccinated 48 N(%)	Unvaccinated 346 N(%)			
Disposition	Discharged	22(95.7)	40(83.3)	281(81.2)	343(82.3)	0.221*	ARR among vaccinated and Unvaccinated cases (CI)=14.44% (5.14% - 23.73%)
	Mortality Occurred	1(4.3)	8(16.7)	65(18.8)	74(17.8)	**<0.001**$	
Length of Hospital Stay (in Days)	⩽3 Day	3(13.1)	2(4.2)	30(8.67)	35(8.4)	0.875*	Median length of hospital stay (Q1-Q3)=9(6-13)
	4-7 Days	7(30.4)	14(29.2)	104(30.1)	125(29.9)	0.921$	
	8-14 days	9(39.1)	21(43.7)	150(43.3)	180(43.2)		
	>14 Days	4(17.4)	11(22.9)	62(17.9)	77(18.4)		
Need of ICU admission	Required	2(8.7)	10(20.8)	101(29.2)	113(27.1)	**0.055*** **0.032**$	ARR among vaccinated and Unvaccinated cases (CI)=20.50% (8.02% - 32.97%)

ARR= Absolute Relative Risk; *Test Applied is fisher's exact test at 95% CI; **Test Applied is Chi-square test at 95% CI; $Test applied is Fisher's exact between Vaccinated and Unvaccinated (Excluding Partially Vaccinated); statistically significant (p<0.05); vaccinated received two doses, partially vaccinated received one dose

Table 4. Association of vaccine type with disease severity and outcome of the patient admitted to COVID-19 facility (n=71)

Characteristics	Category	Vaccine type of vaccinated case				p-value
		Covishield		Vero Cell		
		Vaccinated 10	Partial Vaccinated 19	vaccinated 13	Partially Vaccinated 29	
Oxygen requirement	<5 lit/min	3	10	8	19	**0.004***
	6-10 lit/min	1	5	3	4	
	>10 lit/min	0	1	0	4	
	Not required	6	3	2	2	
Requirement of ICU	Required	1	3	1	7	0.193*
	Not required	9	16	12	22	
Duration of Hospital Stay	<3 days	2	2	1	0	0.892*
	4-7 days	3	5	4	9	
	>7-14 days	4	9	5	12	
	>14 days	1	3	3	8	
Disposition	Discharge after recovery	9	16	13	24	0.474*
	Mortality	1	3	0	5	
Disease severity	Mild	8	9	5	8	**0.017***
	Moderate	2	9	8	17	
	Severe	0	1	0	4	

*Test Applied is fisher's exact test at 95% CI; statistically significant (p<0.05); vaccinated received two doses, partially vaccinated received one dose

Analysis of different characteristics of disease severity and outcome of patients among the two different vaccine types showed, oxygen requirement was higher in patients who received Vero Cell versus Covishield (p= 0.004) and patients with Vero Cell had more severe symptoms which were statistically significant (p=0.017). There was no difference between these two vaccine types regarding the requirement of oxygen, duration of hospital stay, and disposition with a p-value of 0.193, 0.892, and 0.475 respectively, Table 4.

Oxygen requirement and disposition of patients were statistically significant for the different groups with values 0.008 and 0.003 respectively. Oxygen requirement was more in numbers among the respondents of older age group >60 y than younger age groups. Similarly, mortality was higher in older patients (40 in age group >60 y). Requirement of oxygen, duration of hospital stay, and disease severity were not statistically significant for different age groups of the respondents admitted to COVID facilities of PAHS. There was no significant association between different treatment and outcome characteristics of admitted COVID-19 patients according to gender of the respondents, p= >0.05 for all characteristics like oxygen requirement, requirement of ICU, Duration of Hospital Stay, Disposition and Disease Severity, Table 5.

Table 5. Sub-group analysis of the association between age, gender with various treatment and outcome characteristics of the study in patients admitted to COVID-19 facility (n=417)

Characteristics	Category	Age group in y (N)					p-value	Gender (N)		p-value
		18-30 (37)	31-40 (69)	41-50 (69)	51-60 (93)	>60 (149)		Male (240)	Female (177)	
Oxygen requirement	<5 lit/min	14	27	33	51	63	**0.008***	109	79	0.911
	6-10 lit/min	8	17	14	19	45		60	43	**
	>10 lit/min	4	8	10	15	29		39	27	
	Not required	11	17	12	8	12		32	28	
Requirement of ICU	Required	7	17	13	28	48	0.181**	67	46	0.662
	Not required	30	52	56	65	101		173	131	**
Duration of Hospital Stay	<3 days	4	4	3	10	14	0.193*	22	13	0.404
	4-7 days	14	23	28	27	33		68	57	**
	>7-14 days	17	31	25	39	68		100	80	
	>14 days	2	11	13	17	34		50	27	
Disposition	Discharge after recovery	33	63	62	76	109	**0.003***	192	151	0.161 **
	Mortality	4	6	7	17	40		48	26	
Disease Severity	Mild	17	27	25	28	34	0.121*	73	58	0.875
	Moderate	16	34	34	49	84		127	90	**
	Severe	4	8	10	16	31		40	29	

*Test Applied is fisher's exact test at 95% CI; ** Test applied is the chi-square test at 95% CI; statistically significant (p<0.05)

Discussion

Results of our study show that most of the patients who required admission were unvaccinated. Vaccination might have decreased the necessity of admission, but this was out of the scope of our study. Till November 2021 only two similar types of published studies were found to compare with our study.[19,20]

In our study, mortality was more in the unvaccinated population than in the vaccinated population. The disposition of the patient was statistically significant and we found more mortality in 65(18.8%) cases among unvaccinated cases vs. 1(4.3%) among vaccinated, with a p-value of <0.001. In our study, it was found that for a patient admitted with the diagnosis of COVID-19, the risk of mortality will reduce by 14.44% in comparison to those who are not vaccinated. Thus, vaccination reduces mortality among COVID-19 cases. Further, there was no difference in the mortality on subgroup analysis based on gender and type of vaccine. However, mortality was more in the >60 y subgroup despite vaccination status though it was relatively less than those who were not vaccinated. This is consistent with the study which was released in India during this study which suggested that fully vaccinated patients with Covishield, and younger age patients had lower mortality while patients aged >65 y had higher mortality despite vaccination status.[19]

There was a statistical difference between the requirement of ICU admission (p=0.032) among vaccinated and unvaccinated patients. Absolute Risk Reduction (ARR) for the requirement of ICU admission of COVID-19 patients after complete vaccination compared to unvaccinated COVID-19 patients was 20.50% (8.02%-32.97%) at 95% CI. This means 20.50% of patients will not require ICU admission if vaccinated among the total cases who required ICU out-of-vaccinated and unvaccinated cases (N=369). Thus, vaccination reduces the requirement for ICU admission in COVID-19 cases. Further, there was no statistically significant difference in ICU requirement based on the type of vaccine, age group, and gender.

There was also no statistically significant difference in the length of hospital stay based

on vaccination status, type of vaccine, age, and gender. Severe COVID-19 disease was absent in vaccinated patients, while 5(10.4%) of patients in the partially vaccinated and 64(18.5%) of patients in the unvaccinated group had severe disease. There was no more published data to compare the above findings.

In our study, out of the total admitted patients, the >60 y age group comprised the highest-burden 149(35.7%) with a mean age of 53.79 (SD 16.79), whereas the M: F ratio was 1.35, with males comprising 240(57.6 %) of total admitted patients. In a similar study of cross-sectional design conducted in India during the second wave of the COVID-19 pandemic, the mean age of participants was 54.6 y (SD 17.5) with a higher male preponderance of 783(67.04%).[19] In our study, 23(5.5 %) of admitted COVID-19 patients were vaccinated with both doses of either Covishield or Vero Cell; 48(11.5 %) patients with the first dose of either Covishield or Vero Cell; and 346(83 %) of admitted patients were unvaccinated. According to our study protocol, we excluded the COVID-19 admitted patients if they were vaccinated with the first dose of either Covishield or Vero Cell within 28 days. In a study conducted in India, 184(15.8%) of admitted patients were fully vaccinated with Covishield, 266(22.8 %) were partially vaccinated, and 718(57%) of admitted COVID-19 patients were unvaccinated.[19] This study included 18(4.5%) vaccinated patients within 14 days under the unvaccinated group. [19] In our study, some of the respondents had one or more comorbidities. Among the respondents, hypertension 29.5(29.5%) and diabetes mellitus 63(15.1%) comprise the major proportion. The findings were similar to the study conducted in India, where diabetes and hypertension were major comorbidities, and 518 (44.3%) had one or more comorbidities.[19]

All patients enrolled in our study were symptomatic and admitted through the COVID-19 facility of Patan Hospital. The symptoms observed in the admitted patients in our study were fever 316(75.8%), shortness of breath 316(66.4%), cough 203(48.7%), myalgia 44(10.6%), vomiting 19(4.6%), and loss of taste/smell 4(1%). A descriptive cross-sectional study was conducted at Patan Academy of Health Sciences, where admitted symptomatic COVID-19 patients were analyzed retrospectively.[20.] This cross-sectional study was carried out during the first wave of the COVID-19 pandemic in Nepal, and the symptoms reported were fever 131(65.2 %), weakness 40(19.9%), cough 39(19.4%), running nose 34(16.9%), shortness of breath 29(14.4%), headache 27(13.4%) and sore throat 13(6.5%).[20] The higher frequency of shortness of breath reported during the second wave of the pandemic in our study might be due to the delta variant of the SARS-CoV-2 virus responsible for the pandemic.

None of the fully vaccinated patients either with the Covishield or Vero cell vaccine had severe disease, while 1(5.3%) was partially vaccinated with Covishield and 4(13.8%) partially vaccinated with Vero Cell had severe disease. There was no difference in the severity of the disease according to age group and gender. 8(34.8%) patients among fully vaccinated patients did not require oxygen, while only 47(13.6%) of patients in the unvaccinated group did not require oxygen. None of the fully vaccinated patients required >10L/min of oxygen, while 5(10.4%) partially vaccinated and 61(17.6%) unvaccinated patients required >10L/min of oxygen. 6 (60 %) of vaccinated patients with Covishield did not require oxygen supplementation, while 2(15.4%) fully vaccinated patients with Vero cell did not require oxygen supplementation. Neither of the fully vaccinated patients with Covishield nor Vero Cell required > 10L/min of oxygen. There was no difference in oxygen requirement based on age group and gender.

Hence in our study, we found mortality, ICU admission, and disease severity to be significantly higher in the unvaccinated group. Also, we found oxygen requirement to be higher in the unvaccinated group, which was statistically significant. We did not find any difference in the length of hospital stay

between vaccinated and unvaccinated patients. Furthermore, we did not find any statistically significant difference between the type of vaccine in the reported outcomes except for disease severity and oxygen requirement. In our study, we found those vaccinated with Covishield had lower oxygen requirements and less severe disease which was statistically significant. On overall analysis, both Covishield and Vero cell vaccines were associated with lesser disease severity, lesser ICU admission, and lesser mortality. The major limitation of our study was that our study was a cross-sectional study. The study has generated the hypothesis that there is a better outcome in a patient who is vaccinated with the COVID-19 vaccine in comparison to those who are not vaccinated. A case-control study or a cohort study would be helpful to verify the findings that we have obtained in this study. Also, we did not follow the patients after being discharged from the hospital as the prognosis might be different in both vaccinated and unvaccinated groups. Therefore, this study does not look into the long-term outcome of the patients who were vaccinated versus those who were not vaccinated. Since our study was conducted during the second wave of the COVID-19 pandemic when the vaccine supply from India was completely halted, we can expect a lower % of vaccine coverage during the period from June to August 2021 when our study was conducted. However, this study took the initiative to present real-world prospective data about the effectiveness of vaccines Covishield and Vero cell to the scientific community. Our study supports the current vaccination campaign to prevent future waves of the COVID-19 pandemic. Our study also encourages further research with a larger sample size to compare the effectiveness of Covishied and Vero cell.

Conclusion

Among the admitted COVID-19 patients, mortality was more among the age group >60 years and the unvaccinated group. The ICU requirement was significantly high in those who were not vaccinated. Vaccination status makes no difference in the duration of hospital stay. The requirement of ICU and duration of hospital stay were not associated with age group, gender, and type of vaccine. The Disposition, requirement of ICU, and duration of hospital stay have no statistical difference with the type of vaccine (Covishield and Vero Cell). Oxygen requirement was more in the unvaccinated group.

Acknowledgment

We acknowledge Ujwal Gautam from BPKIHS, and Mr. Raj Kumar Sangroula from Lord Budhha Academy of Health Sciences, Baneshwor, Kathmandu, Nepal for their contribution for editing the manuscript.

Conflict of Interest

None

Funding

None

Author Contribution

Concept, design, planning: JS, MKS, AS, BMS; Literature review: BMS, AJ, BP; Data collection/analysis: MKS, SM, NU, BR, BD; Draft manuscript: MKS, SM, JS, BMS; Revision of draft: BP, AJ, NU; Final manuscript: MKS, AS.

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