

Side Effects of COVID-19 Vaccination among Indian Population - An Online Survey

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ABSTRACT

Background: India has successfully accomplished the administration of 100 crore doses of Covid-19 vaccination. However, there are not many reports regarding the post-vaccination experience. The aim of this study was to determine the side effects of Covid-19 vaccination in southern part of India.

Methods: An online cross-sectional survey was conducted to collect information related to the post vaccination experience in southern part of India. The prevalence of different side effects along with their 95% confidence intervals were reported. The association of demographic characteristics and co-morbidities with side effects of vaccine were also estimated.

Results: Almost 70% of the survey participants reported at least one side effect. Pain at the site of injection was the most common side effect followed by body pain, fever, fatigue, muscle pain and head ache. The side effects were found significantly higher among the younger adults (ages 18-35 years). Female respondents experienced more side effects than males.

Conclusion: The information regarding the potential side effects identified through this survey study can be useful in educating the community and easing the reluctance towards Covid-19 vaccination.

Keywords: Covid-19; Side effect; Vaccination; India

INTRODUCTION

India accomplished the administration of 100 crore doses of the Covid-19 vaccination in October 2021¹. Although the safety and efficacy of the various brands of Covid-19 vaccines are ongoing²⁻⁶, the details of post-vaccination experience in the physical world are obscure. The aim of the survey was to investigate the side effects of Covid-19 vaccination in southern part of India. Knowledge regarding the possible side-effects of Covid-19 vaccine can be useful to

educate the community and ease the reluctance towards Covid-19 vaccination.

MATERIALS AND METHODS

An online cross-sectional survey was conducted using a questionnaire related to the post vaccination experience. The consent from the study participants was obtained during online data collection. The questions focused on the various possible side-effects, co-morbidities and socio-demographic factors. The eligible participants should have received the latest dose of the vaccine (Covishield or

Covaxin), the first or the second dose, not more than thirty days before filling in the questionnaire.

Statistical analyses:

Frequencies and percentages were used to summarise categorical variables. The prevalence of side effects along with their 95% confidence intervals (CIs) were estimated. Age was summarized using median and inter-quartile range (Q₁,Q₃). The normality was assessed using Kolmogorov-Smirnov test. The association of demographic characteristics and co-morbidities with side effects of vaccine was assessed using Chi-square/ Fisher’s exact test. All the statistical analyses were carried out using R software version 4.1.1. A p-value less than 0.05 was considered to be statistically significant.

RESULTS

Description about the study participants

A total of 560 people participated in the survey. The median age of study participants found to be 55 (Q₁=35, Q₃=65). The respondents were mostly from the younger (37.0%) and middle age (37.3%) groups followed by elderly population (25.7%). The survey had a higher proportion of female respondents (55.9%) when compared to males (44.1%). Alcohol consumption and smoking were found to be 11.1% and 9.5%, respectively. Diabetes was the most common co-morbidity (24.3%) and hypertension was the second most prevalent co-morbidity (19.1%).The distribution of the demographic characteristics and co-morbidities among the respondents is given in Table 1.

Table 1: Summary of demographic characteristics and co-morbidities

		Frequency	Percentage
Demographic characteristics			
Age	Young adults (ages 18-35 years)	207	37.0
	Middle-aged adults (ages 36-55 years)	209	37.3
	Older Adults (aged older than 55 years)	144	25.7
Gender	Female	313	55.9
	Male	247	44.1
Smoking	Yes	53	9.5
	No	507	90.5
Alcohol	Yes	62	11.1
	No	498	88.9
Co-morbidities			
Hypertension	Present	107	19.1
	Absent	453	80.9
Heart disease	Present	28	5.0
	Absent	532	95.0
Diabetes	Present	136	24.3
	Absent	424	75.7
Cholesterol	Present	65	11.6
	Absent	495	88.4
Kidney problems	Present	8	1.4
	Absent	552	98.6
Stroke	Present	12	2.1
	Absent	548	97.9

Proportion of side effects

Among the 560 people participants of the survey, 389 (69.5%) experienced at least one of the side effects. The most frequently observed side effect was pain at the site of injection, 40.2% (95% CI: 36.14, 44.26). Body pain was experienced by 31.6% (95% CI: 27.75, 35.45) of the respondents. Fever was reported by 26.4% (95% CI:

22.75,30.05) followed by fatigue 17.9% (95% CI: 14.72, 21.08), muscle pain 15.7% (95% CI: 12.69,18.71) and head ache 13.8% (95% CI: 10.94, 16.66). Back pain, chills and diarrhea was reported by 6.1% (95% CI: 4.12, 8.08), 4.5% (95% CI: 2.78,6.22) and 1.3% (95% CI: 0.36, 2.24) respectively. The least observed side effect was chest pain 0.7% (95% CI: 0.01, 1.39) [Figure 1].

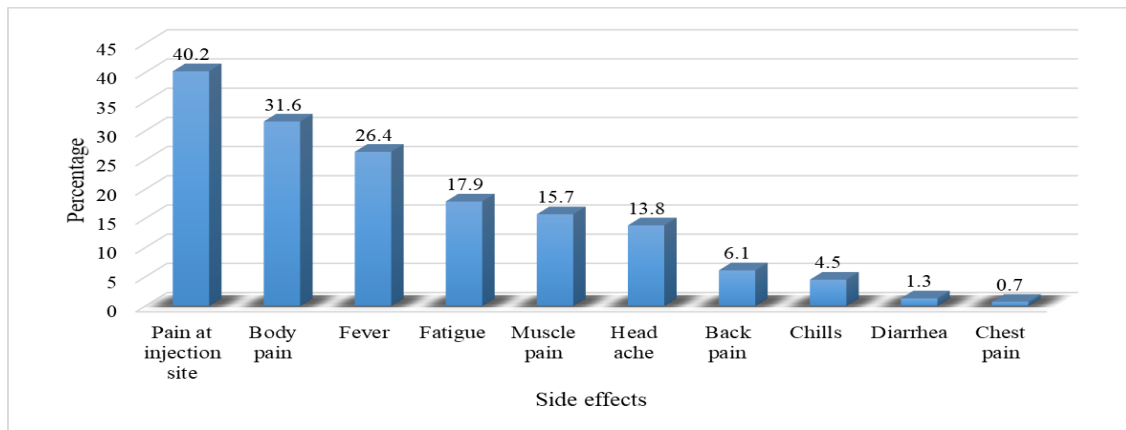


Figure 1. Frequency distribution of side effects

Summary of Covid-19 vaccine side effects across different demographic characteristics and co-morbidities

The summary of Covid-19 vaccine side effects across different demographic characteristics is provided in Table 2. The side effects were higher among the younger (76.8%) and middle age group (68.9%) when compared to the elderly (59.7%).

Among female respondents, 75.4% experienced side effects whereas among the males the proportion was 61.9%. Among smokers, 66.0% and 64.5% among those who consume alcohol reported side effects. The proportions of side effects were higher among those who do not smoke and do not consume alcohol.

Table 2. Summary of Covid-19 vaccine side effects across different demographic characteristics

Variables		Side effect	
		Present (%)	Absent (%)
Age	Young adults (ages 18-35 years)	19 (76.8)	48 (23.2)
	Middle-aged adults (ages 36-55 years)	144 (68.9)	65 (31.1)
	Older Adults (aged older than 55 years)	86 (59.7)	58 (40.3)
Gender	Female	236 (75.4)	77 (24.6)
	Male	153 (61.9)	94 (38.1)
Smoking	No	354 (69.8)	153 (30.2)
	Yes	35 (66.0)	18 (34.0)
Alcohol	No	349 (70.1)	149 (29.9)
	Yes	40 (64.5)	22 (35.5)

The summary of Covid-19 vaccine side effects among the different comorbidities is provided in Table 3. The proportion of side effects was higher among those who did not have the comorbidity.

Table 3. Summary of Covid-19 vaccine side effects among the different comorbidities

Variables		Side effect	
		Present (%)	Absent (%)
Hypertension	Yes	78(72.9)	29(27.1)
	No	311(68.7)	142(31.3)
Heart disease	Yes	15(53.6)	13(46.4)
	No	374(70.3)	158(29.7)
Diabetes	Yes	97(71.3)	39(28.7)
	No	292(68.9)	132(31.1)
Cholesterol	Yes	51(78.5)	14(21.5)
	No	338(68.3)	157(31.7)
Kidney problems	Yes	5(62.5)	3(37.5)
	No	384(69.6)	168(30.4)
Stroke	Yes	9(75.0)	3(25.0)
	No	380(69.3)	168(30.7)

Association of the side effects of Covid-19 vaccine with demographic characteristics and co-morbidities was also studied. The side-effects namely body pain, fever, fatigue, muscle pain and headache were significantly associated with age. All these side effects were higher in proportion among young adults (ages 18-35 years). Fever and pain at the site of injection had a significant association with gender, with females experiencing these side effects more than males. Pain at the site of injection was also associated with alcohol. The details are provided in Table 4 and Table 5 respectively.

Table 4. Association of demographic characteristics with Covid-19 vaccine side effects

Variables	Pain at the site of injection	Body pain	Fever	Fatigue	Muscle pain	Headache
Age group						
Young (207)	89(43.0)	83(40.1)	76(36.7)	51(24.6)	46(22.2)	48(23.2)
Middle (209)	89(42.6)	64(30.6)	49(23.4)	33(15.8)	32(15.3)	24(11.5)
Old (144)	47(32.6)	30(20.8)	23(16.0)	16(11.1)	10(6.9)	5(3.5)
p-value	0.100	0.001*	<0.001*	0.003*	0.001*	<0.001*
Gender						
Female (313)	146(46.6)	105(33.5)	95(30.4)	61(19.5)	50(16.0)	50(16.0)
Male (247)	79(32.0)	72(29.1)	53(21.5)	39(15.8)	38(15.4)	27(10.9)
p-value	<0.001*	0.270	0.020*	0.260	0.850	0.800
Smoking						
Yes (53)	17(32.1)	18(34.0)	14(26.4)	11(20.8)	10(18.9)	5(9.4)
No (507)	208(41.0)	159(31.4)	134(26.4)	89(17.6)	78(15.4)	72(14.2)
p-value	0.210	0.700	0.990	0.560	0.510	0.340
Alcohol						
Yes (62)	17(27.4)	25(40.3)	17(27.4)	15(24.2)	13(21.0)	6(9.7)
No (498)	208(41.8)	152(30.5)	131(26.3)	85(17.1)	75(15.1)	71(14.3)
p-value	0.030*	0.120	0.850	0.160	0.230	0.320

* Statistically significant (p<0.05)

A statistically significant association was found between hypertension and side effects namely body pain, muscle pain and headache. These side effects along with

fatigue had a significant association with diabetes. Pain at the site of injection, body pain, fever, muscle pain and headache were associated with cholesterol.

Table 5. Association of co-morbidities with Covid-19 vaccine side effects

Variables	Pain at the site of injection	Body pain	Fever	Fatigue	Muscle pain	Head ache
Hypertension						
Yes (107)	47(47.0)	25(23.4)	22(20.6)	13(12.1)	9(8.4)	6(5.6)
No (453)	178(43.9)	152(33.6)	126(27.8)	87(19.2)	79(17.4)	71(15.7)
p-value	0.380	0.040*	0.130	0.090	0.020*	0.007*
Heart disease						
Yes (28)	8(28.6)	5(17.9)	5(17.9)	4(14.3)	2(7.1)	1(3.6)
No (532)	217(40.8)	172(32.3)	143(26.9)	96(18.0)	86(16.2)	76(14.3)
p-value	0.200	0.110	0.290	0.800	0.290	0.160
Diabetes						
Yes (136)	62(45.6)	28(20.6)	30(22.1)	15(11.0)	11(8.1)	9(6.6)
No (424)	163(38.4)	149(35.1)	118(27.8)	85(20.0)	77(18.2)	68(16.0)
p-value	0.140	0.001*	0.180	0.020*	0.005*	0.006*
Cholesterol						
Yes (65)	37(56.9)	13(20.0)	10(15.4)	12(18.5)	3(4.6)	1(1.5)
No (495)	188(38.0)	164(33.1)	138(27.9)	88(17.8)	85(17.2)	76(15.4)
p-value	0.004*	0.030*	0.030*	0.860	0.006*	0.001*

* Statistically significant (p<0.05)

DISCUSSION

Almost 70% of the survey participants reported at least one side effect. Pain at the site of injection was the most common side effect (40.2%) followed by body pain (31.6%), fever (26.4%), fatigue (17.9%), muscle pain (15.7%) and head ache (13.8%). The side effects were found significantly higher in younger age group (40.9%). Female respondents experienced more side effects than males.

A cross-sectional survey study among individuals in the United Arab Emirates by Saeed et al⁷ reported that side effects of Sinopharm COVID-19 vaccination such as injection site pain, fatigue and headache were more common in

participants aged ≤49 years. Similar findings were observed in the present study based on Indian vaccines. Body pain, fever, fatigue, muscle pain and headache were the side effects that had a significant association with age and majority of these conditions were observed in the age group below 35 years.

In line with the findings of Jayadevan et al⁸, female respondents experienced more side effects in the present study. Fever and pain at the site of injection had significant association with gender. A significant association of side-effects with gender was also reported by Elnaem et al based on a cross-sectional survey conducted in Malaysia⁹.

A significant association of hypertension, diabetes and cholesterol was found with side effects namely body pain, muscle pain, headache, fatigue and pain at the site. It is worth noting that the proportion of side effects were more among the respondents who did not have these three comorbidities, although there is no evidence to confirm this finding. A possible explanation for the lower occurrence of Covid-19 vaccine side effects among those with comorbidities could be due to the diet, medication and lifestyle habits.

As the responses from the study participants were collected through an online survey, there were a few challenges and limitations. Verification of information and identity of respondents was not possible. Although the survey questionnaire was circulated among a vast group, the number of complete responses was less in number which in turn affected the sample size for the study.

CONCLUSION

The present study will provide an insight to the side effects of Covid-19 vaccination in the southern part of India and knowledge regarding the impact of comorbidities on the side effects.

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