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COVID-19 vaccine uptake and its determinants in hilly area in Satara district: A cross sectional study

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Abstract--Covid-19 pandemic is newer to human kind and vaccination is the most important weapon which can prevent and protect us from this highly infectious disease. The vaccines used in the war against Covid are relatively new and are manufactured after studies of just few months! Due to urgency and need of vaccine as weapon it was necessary to manufacture them earlier but still they are allowed to be used on emergency basis and not on regular basis due to limitation of stage 4 data. There are various factors which are responsible for vaccine uptake in general population and this study was conducted to find out those Objective: To find out Various determinants responsible for covid -19 vaccine uptake in hilly area of Satara district. Result: The vaccine hesitancy was observed in around 5% of the young age group 18-40 years of age whereas it was very low in age group more than 60 Years. The health care workers were the motivators for most of the reluctant beneficiaries and they easily were convinced to take the vaccine. Conclusion: Covid-19 vaccine uptake was high in hilly area. ASHA worker, primary health center staff & gram panchayat members played an important role in motivating the population and successfully completing their vaccination.

Keywords--vaccine, COVID-19, hesitancy.

Introduction

Covid-19 sign, symptoms, morbidity and mortality are very much unpredictable. The pandemic of Covid-19 has caused burden on the health system of globe. Vaccine is single most powerful weapon which could help us control the pandemic. It has been found from the available data that those who recover from COVID-19 develop an immune response that provides at least some period of protection against reinfection; although we're still learning how strong this protection is, and how long it lasts.

COVID vaccines have only been developed with study of just few months unlike previous vaccines against vaccine preventable diseases. Vaccine hesitancy is the reluctance or refusal to vaccinate despite the availability of vaccines. Many patients may feel reluctant about getting the COVID vaccine. The impact of COVID-19 vaccines on the pandemic will depend on several factors. These include the effectiveness of the vaccines; how quickly they are approved, manufactured and delivered; the possible development of other variants and how many people get vaccinated.

Trials have shown several COVID-19 vaccines to have high levels of efficacy. WHO is working to help ensure that approved vaccines are as effective as possible, so they can have the greatest impact on the pandemic. It has been observed, vaccine is highly effective at reducing severe illness and death from covid-19¹. A recent progress review of the Global Vaccine Action Plan stated that 'countries should urgently identify barriers and bottlenecks and implement targeted approaches to increase and sustain immunization coverage.'²

All non-socio-demographic determinants of coverage could be organized into 5 dimensions: Access, Affordability, Awareness, Acceptance & Activation.² Vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccination services³. It has been observed that there was a lot of hesitancy for Covid-19 vaccine in initial period. There was news in print media about vaccine hesitancy in remote areas mainly due to lack of awareness⁴. Satara district of Maharashtra where this medical college is situated comprises of a taluka which is recognized as hilly area. This study was planned to identify level of Covid-19 vaccine uptake & its determinant so as to improve the vaccine uptake in hilly areas.

Objectives

1. To find out attitude towards covid-19 vaccine in the Hilly area.
2. To evaluate various determinants regarding vaccine uptake in Hilly area.

Material and Methods

A cross-sectional analytical study was conducted in Patan taluka of Satara district. Maharashtra government has recognized whole Patan taluka as a hilly area. Study subjects were adults above 18years of age & eligible for immunization residing in selected village. Sample size: Assuming 50% of individuals eligible for vaccination are in favor of acceptance of the Covid-19 vaccine or/and got

vaccinated, the minimum number of individuals enrolled in this study with 95% level of significance and 7% absolute precision was 196 [$n=Z^2pq/d^2=(1.962 \times 50 \times 50)/72$]. It was decided to include 200 subjects to make round figure.

Sampling technique: To accomplish the determined sample size, villages were selected by lottery method from Patan taluka, a hilly area as recognized by government. Total ten villages were selected. Assuming same psycho-social environment in the selected villages, 10% of sample size i.e. 20 individuals, as and where available (Consecutive sampling technique), from each selected village were included in the study. Thus total 200 individuals i.e. 20 from each of 10 randomly selected villages were enrolled with their consent in the study. **Study Tool:** A questionnaire appropriate for the study was developed with the help of references & expert colleagues & validated. Questionnaire was in Marathi for the ease of administration

After getting permission from Institutional Ethical Committee, data collection was started. Permission was obtained from the Sarpanch (Village head) of selected villages to conduct survey in village. Study subjects were explained the purpose of study. After obtaining consent data collection was done by interview technique. Data was collected by investigator & co-investigator along with interns. Interns were trained for the same.

Results

Table1: Association between social determinants & vaccination status

Variables	Vaccination status			Total	
	No vaccine	1 dose	2dose		
Age					
18-40yrs	5(5.10)	48(48.98)	45(45.92)	98(100.00)	chi sq=5.60 p=0.230 df=2
40-60yrs	4(4.82)	35(42.17)	44(53.01)	83(100.00)	
60-80yrs	1(2.63)	11(28.95)	26(68.42)	38(100.00)	
Gender					
Female	4(3.67)	51(46.79)	54(49.54)	109(100.00)	chi sq=1.50 p=0.472 df=4
Male	6(5.45)	43(39.09)	61(55.45)	110(100.00)	
Education					
Illiterate	1(2.70)	18(48.65)	18(48.65)	37(100.00)	chi sq=3.64 p=0.725 df=6
5-10 years	6(6.98)	37(43.02)	43(50.00)	86(100.00)	
11-13 years	2(3.70)	24(44.44)	28(51.85)	54(100.00)	
Postgraduate & Professional	1(2.38)	15(35.71)	26(61.90)	42(100.00)	
Occupation					
Farmer	6 (6.25)	44(45.83)	46(47.92)	96(100.00)	chi sq=6.03 p=0.197 df=4
Housewife	2(3.57)	28(50.00)	26(46.43)	56(100.00)	
Others	2(2.99)	22(32.84)	43(64.18)	67(100.00)	
Awareness Score					
5-6	4(6.67%)	22(36.67)	34(56.67)	60(100.00)	Chi sq=1.82 Df=2
7-8	6(3.77)	72(45.28)	81(50.94)	159(100.00)	

					P=0.402
Total	10(4.57)	94(42.92)	115(52.51)	219(100.00)	

Total 219 subjects from 10 villages were interviewed. From each village two extra participants were interviewed so as to take care of any incomplete interview schedule. It included 109(49.77%) females & 110 (50.22%) males. Age ranged from 18 years to 80 years. Mean age was 44.97 while median age was 60 years. Education wise 37(13.26%) were illiterate. For the sake of analysis two graduates (15 yrs education) were included in the group of 11-13 years' education. All villages were accessible by road. Occupation wise 96(43.83%) were farmers. 'Other' group of occupation includes service, shopkeepers & other private jobs.

For assessment of awareness eight questions were asked as follows preventive measures for corona, availability of vaccine for covid 19, number of vaccines available in India & their names & place of availability. Total eight marks were allotted. All participants scored above '5' (Out of 8, i.e. 65% score). Main source of their awareness was ASHA worker (116, 52.96%), followed by PHC staff, television, gram panchayat (local governing body) members, janjagruti abhiyaan (awareness campaign).

On the day of survey only 10 (4.57%) participants were unvaccinated. Participants vaccinated with two doses were 115 (52.51%) & 94(42.92%) with one dose. Proportion of Unvaccinated participants was more in young age (18-40yrs) group (5.10%), in males(5.45%), in participants with 5-10 yrs of education (6.698%) & in participants with less awareness score (6.67%). However the association was not statistically significant.

Out of 10 unvaccinated participants five (50%) were firm on their decision of not to undergo vaccination. Reasons for non-acceptance were small child at home; don't want to take, long distance, suffering from anemia, fear of vaccination. However eight out of ten unvaccinated participants were accepting that getting vaccinated will protect themselves from covid 19.

Discussion

This study was conducted to find out the proportion of adult populations' acceptance of corona vaccine. First time in recent days almost all over the world, a new vaccine was introduced as an emergency intervention for adults as a mass vaccination program. There was a mixed response for its acceptance. So it was interesting to know what is happening in hilly remote areas & also of great value in using this information in planning such programs.

From total 10 villages total 219 study subjects participated in the study. Out of 219 total 209(95.43%) were vaccinated. Fully vaccinated were 115 (52.51%). Remaining 94(42.92%) participants were vaccinated with one dose & were willing & waiting for second dose. A systematic review of peer-reviewed published studies on vaccine acceptance rate among general population adults from 33 countries was done. It was observed that highest COVID-19 vaccine acceptance rates found in Ecuador (97.0%), Malaysia (94.3%), Indonesia (93.3%) and China (91.3%). However, the lowest COVID-19 vaccine acceptance rates were found in

Kuwait (23.6%), Jordan (28.4%), Italy (53.7), Russia (54.9%), Poland (56.3%), US (56.9%), and France (58.9%). Our study results are comparable with that of high acceptance rate countries⁵.

There were only 10(4.57%) participants unvaccinated. Vaccination refusal was more common in young age (18-40 yrs), male gender with lower awareness score. However, there was no statistically significant association found between status of vaccination & age, gender & educational status. (Table No1) Out of ten unvaccinated, eight subjects were aware of vaccines protective efficacy & its safety. Other family members of unvaccinated study subjects who were eligible for vaccination had received vaccine. Out of ten unvaccinated, five said that they are planning to receive immunization soon. May be these subjects are now sure of vaccine safety. Remaining five people were vaccine resistant. Reason for not going for vaccination was just 'don't want to take'.

Awareness score was overall high. All have scored above 50%. All participants were aware of availability of vaccine for prevention of Covid19. Most common source of information about covid-19 & its vaccine was ASHA worker (116, 52.96%). Other sources were Primary Health Centre staff & gram panchayat members (elected members of Local governing body) through Jan Jagruti Abhiyan conducted by them. Television was another source.

Reasons for high vaccination acceptance was better awareness in general population. Source of information was ASHA workers & Primary Health Centre staff, who were immunized first. This helped in gaining the confidence of people. Jarrett C et al⁶ concludes in a systematic review regarding the various interventions used for tackling vaccine hesitancy the most effective strategy is a dialogue based strategy rather than incentive based or reminder or recalled based. Kumar et al⁷ has stated in his article on parental hesitancy for pediatric vaccines that important factor determining the acceptance of vaccination is trust on health professionals, Government or public health authorities & their inter-relations. Eskola et al⁸ has mentioned that for high vaccination coverage, basic requirements are understanding of the need & value of vaccination in the population, availability of vaccine & accessibility of immunization services. In Study area all these strategies were used. In accessibility, both distance & economic accessibility has been taken care of.

Summary and Conclusion

Conclusion: Covid-19 vaccine uptake was high in hilly area. ASHA worker, primary health center staff & gram panchayat members played an important role in motivating the population and successfully completing their vaccination. Few individuals showed the hesitancy and reluctance for getting vaccination and the answer given by them was simple No! They don't want to take it.

Conflict of interest

There was no conflict of interests for the study.

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