Knowledge, Attitude and Practice with Regard to Preventive Measures of Covid-19 across Community in the above 18-Years Age Group in Nandyal District, Andhra Pradesh, India

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ABSTRACT

BACKGROUND

Present pandemic COVID-19 outbreak in China is spreading globally. WHO confirmed 8.126 million cases and deaths were 445K globally. India recorded 377974 confirmed cases and 14240 deaths and Andhra Pradesh 7071 confirmed cases and 90 deaths, with a mortality of 3.3 % according to sources of health ministry and from updates 18th June 2020 news bulletin.

METHODS

This is a prospective cross sectional observational, study conducted in Nandyal, Andhra Pradesh. 1734 participants (384 general population, 250 doctors, 450 nurses, 550 class IV staff, 50 pharmacists and 50 police personnel) were included and modified predesigned WHO Questionnaire was used to collect the data. 1350 participants frontline healthcare personnel, pharmacists and police were enrolled for hydroxychloroquine prophylaxis; 384 participants used preventive measures like masks, social distancing, hand washing, staying at home, and usage of Aarogya Setu App. The collected data was analysed using SPSS version-22 software. Results were tabulated for demographic details, knowledge, attitude, practice analysis and statistical analysis.

RESULTS

39.6 % had knowledge, 68 % had attitude to adopt measures and 72.7 % were following preventive measures and 3.1 % were using Aarogya Setu App to protect themselves from COVID-19. 1350 participants were HCQ prophylaxis for 7 weeks; in these participants, pre- and post-tests were done and were found to be negative for corona infection; 1.6 % had mild ADRs. In order to prevent the spread of COVID-19, 100 % awareness among the community is required.

CONCLUSIONS

Though general population had 39.6 % knowledge on preventive measures for corona, 72.7 % were following them. On the other hand, frontline healthcare professionals and workers who were on hydroxychloroquine prophylaxis were found to be negative for corona infection.

KEYWORDS

COVID-19, Face Masks, Hand Washing, Social Distancing, Aarogya Setu App, HCQ Prophylaxis

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BACKGROUND

Novel corona virus outbreak in December 2019 emerged in Wuhan, China, as SARS (Severe Acute Respiratory Syndrome) -CoV2, exhibiting pneumonia like symptoms. During 2002 and 2012, major human disaster occurred in China as SARS and in Saudi Arabia as MERS-CoV, with mortality rate of 11 % and 34 % respectively.[1,2] WHO (World Health Organization) on 18th June 2020, confirmed COVID cases are 8.126 million and deaths 445K were reported globally and expecting to reach highest numbers.[3] India records 377974 confirmed cases and 14240 deaths, updates from 18th June 2020 news bulletin.[4] Andhra Pradesh 7071 confirmed cases and 90 deaths, updates from 18th June 2020 news bulletin.[5] The mortality rate in Andhra Pradesh, India is around 3.3 %, from the sources of health ministry.[6] The virus was not detected in humans and animals previously but gene sequence evidences have suggested that people in Wuhan were carrying the virus similar to the virus identified in bats.[7] COVID-19 first confirmed cases related to the Huanan wet market in Wuhan and its rapidly increasing cases have drawn global attention.[8] Since January 2020 all suspected new cases were infected transmitted across entire China and to other countries as pandemic.[9] On 22nd March 2020, as a preventive prophylaxis measure National Task Force for COVID-19 constituted by ICMR (Indian Council Of Medical Research) has recommended to use HCQ (Hydroxy-Chloro-Quine) for high risk population (Frontline Health care workers above 15 years, asymptomatic household lab positive contacts) under Pharmacovigilance Program of India, Indian Pharmacopoeia Commission. Later on 26th March 2020 revised advisory recommended to even include other frontline workers working in Non-Covid and Covid duties (health care workers, police personnel, asymptomatic household lab positive contacts).[10,11] On 26th May 2020 Government of India has launched Aarogya Setu App, recommended and advised all citizens to download for mapping the identified COVID cases from risk of further spread in the community.[12] Therefore need for this study is to assess awareness among community about COVID contagiousness and preventive measures taken by the general population and determine hydroxychloroquine prophylaxis outcome among frontline health care professionals, workers and police personnel in Nandyal, Andhra Pradesh, India to contain spread.

Objectives

- To assess the preventive measures of COVID-19 taken across community, among population aged 18 years and above in Nandyal.
- To assess regarding knowledge, attitude and practice measures adopted: wearing face mask, hand washing, maintaining social distancing, staying at home by general population and regarding usage of hydroxychloroquine among frontline workers.
- To determine the prevalence of usage of mobile Aarogya Setu App to control the spread of corona spread by general population.
- To determine the health outcomes following administration of the tablet hydroxychloroquine, 400 mg twice a day on starting day followed by 400 mg weekly once for 7 weeks to health care professionals.

METHODS

Study Design and Study Area

It's a community based cross sectional, prospective observational study carried across Nandyal, Andhra Pradesh, which is spread over an area of 28.88 Km^2 with constituent of municipality accommodating population of about 2.7 lakh as per NFHS-4. Study was carried during Feb 2020 to June 2020.

Sampling and Sample Size

Sample Size was calculated taking population of 2.7 lakh with considering 5 % of confidence interval and confidence level at 95 % and sample size was 384 for general population. The subjects for general population were enrolled using simple random sampling method. 250 doctors, 450 nursing staff, 550 class IV staff including scavengers, 50 pharmacists from both Santhiram General Hospital and Government General Hospital, Nandyal, and 50 police personnel were enrolled for the study with IEC number: IEC / 2020 / 051, for using hydroxychloroquine as prophylaxis treatment. The study subjects were followed and monitored for entire 7 weeks.

Study Subjects

Total of 1734 subjects was enrolled for the study. Institutional Ethics Committee has approved the study. Participants who gave written informed consent and are above 18 years and below 70 years were included. Non-compliant participants, below 18 years, sick with preexisting comorbid conditions and with no written informed consent were excluded from the study.[13]

Predesigned WHO standard Knowledge, Attitude and Practice questionnaire, is modified on COVID infection about covering nose and face with mask or with handkerchief or with elbow, regular hand washing, maintain about 2-meter social distance, strictly staying at home. Introduction of mobile App and usage of Aarogya Setu app in preventing COVID-19 spread for 384 general population.[14] 1350 (250 Doctors + 450 Nursing Staff + 550 Class IV + 50 Pharmacists + 50 Police personnel) asymptomatic health care professionals and workers were enrolled from Santhiram General Hospital and Government General Hospital, Nandyal and Police personnel were given separate predesigned questionnaire to fill voluntarily, who were posted for COVID duties were administered with tablet hydroxychloroquine 800 mg stat on day one orally, followed by 400 mg once a week for 7 weeks orally under supervision by Pharmacovigilance Adverse Drug Monitoring Center Coordinator from Santhiram Medical College.[10,11]

Participants	Gender		Total
	Male	Female	
General Population	288 (75.0 %)	96 (25.0 %)	384 (100 %)
Doctors	156 (62.4 %)	94 (37.6 %)	250 (100 %)
Nursing Staff	58 (12.8 %)	392 (87.2 %)	450 (100 %)
Class IV staff	248 (45.0 %)	302 (55.0 %)	550 (100 %)
Pharmacists	23 (46.0 %)	27 (54.0 %)	50 (100 %)
Police Personnel	38 (76.0 %)	12 (24.0 %)	50 (100 %)
Total with Percentage	**811 (46.77 %)**	**923 (53.23 %)**	**1734 (100 %)**

Table 1. Gender Distribution of Different Groups of Participants Enrolled in the Study

Knowledge	n = 384	100 %
How does the Corona Spread?		
Droplets generated form cough	226	58.9
Sneeze	0	0
Nasal Discharge	3	1.6
All	152	39.6
Not Known	0	0
Can you Contract the Corona Virus Disease by Touching a Surface?		
Yes	155	40.4
No	147	38.3
Not Known	82	21.4
How Long does the Corona Virus Last on Surface?		
Few hours to several days	3	0.8
Months	328	85.4
Years	53	13.8
Not known	0	0
What Happens When You Get Affected with Corona Virus?		
Mild respiratory symptoms with fever	136	35.4
Infection starts on an average of 5-6 days	0	0
Headache and body pains	0	0
All	248	64.6
Not Known	0	0
What Are the Symptoms of Corona Virus Disease?		
Fever, cough, shortness of breath	42	10.9
Breathing difficulties like pneumonia	25	6.5
Severe acute respiratory syndrome	79	20.6
All	47	12.2
Not Known	191	49.7
What is the Treatment for Corona Disease?		
No specific treatment	157	40.9
No Vaccine	47	12.2
Prevention	180	46.9
Not Known	0	0
Do You Know About Quarantine?		
Yes	194	50.5
No	128	33.3
Not Known	62	16.1
Do You Wear Face Mask?		
Yes	90	23.4
No	294	76.6
Do You Know About Hand Washing?		
Yes	96	25.0
No	288	75.0
Do You Know About Social Distancing?		
Yes	85	22.1
No	299	77.9
Do You Stay at Home?		
Yes	53	13.8
No	331	86.2
Do You Know About Aarogya Setu App?		
Yes	42	10.9
No	342	89.1
How Do You Prevent Spread of Corona Virus Disease?		
Know (Wearing face mask + Handwash + Social distancing + Staying at Home)	279	72.7
Not known	105	27.3
Attitude	n=384	100 %
How Do You Clean Your Hands?		
With soap and water	142	37
Alcohol based Hand Sanitizer	0	0
Only Water	23	6
Wipe with Tissue paper	0	0
Using both Soap and Water and Hand Sanitizer	114	29.7
Occasionally with Soap and Water	105	27.3
How Many Times Do You Wash Your Hands?		
Daily Once / twice	0	0
Washing Before and After eating	0	0
Washing After going to Rest room	0	0
Washing after every activity	114	29.7
Washing Before and After eating and After going to Rest room	162	42.2
Washing Occasionally	108	28.1
How Do You Protect from Cough, Sneeze and Cold?		
Wearing Mask	35	9.1
Covering with Handkerchief	31	8.1
Keep Elbow to cover nose and mouth	10	2.6
All	261	68
Do Not cover mouth	47	12.2
What Do You Mean by Social Distancing?		
Keep 2-meter Distance	290	75.5
Keep 1 feet Distance	9	2.3
Keep 1 Square Feet Distance	0	0
Keep 1 Shoulder Distance	13	3.4
Do Not Know	72	18.8
Do You Think Staying at Home Can Prevent Corona Spread in Community?		
Yes	248	64.6
No	0	0
Not Known	136	35.4
Are You Willing to Use Aarogya Setu App?		
Yes	11	2.9
No	373	97.1
Not Known	0	0
Practice	n=384	100 %
Are You Following Hand Wash Regularly?		
Following	249	64.8
Not following	135	35.2
Are You Covering Yourself with Face Mask to Prevent from Droplet Infection?		
Following	269	70.1
Not following	115	29.9
Are You Maintaining Social Distancing?		
Following	234	60.9
Not Known	150	39.1
Are You Staying at Home?		
Following	268	69.8
Not Known	116	30.2
Are You Practicing Using Aarogya Setu App?		
Following	12	3.1
Not following	372	96.9

Table 2. Questionnaire on Knowledge, Attitude and Practice on COVID-19 for General Population

Knowledge Regarding Various Behavioural Factors That Mitigate the Disease Spread	Practice		P-Value
	Yes	No	
Face Mask			
Yes	202 (72.4)	77 (27.6)	0.101
No	67 (63.8)	38 (36.2)	
Hand wash			
Yes	194 (69.5)	85 (30.5)	0.002*
No	55 (52.4)	50 (47.6)	
Social Distancing			
Yes	179 (64.2)	100 (35.8)	0.035*
No	55 (52.4)	50 (47.6)	
Staying at Home			
Yes	206 (73.8)	73 (26.2)	0.005*
No	62 (59.0)	43 (41.0)	
Aarogya Setu App			
Yes	12 (4.3)	267 (95.7)	0.559
No	6 (5.7)	99 (94.3)	

Table 3. Assessment of Various Behavioural Factors That Mitigate the Disease Spread - Knowledge vs. Practice.

Thorough screening of all participants was carried out by general physicians, ophthalmologists and cardiologists which included vitals, such as pulse, blood pressure, fundal examination and required investigations performed such as ECG, serum creatinine, blood urea, RBS, LFT, Rapid COVID test before administration of drug. Subjects with normal vitals and investigations within normal limits were administered with tablet HCQ as per ICMR guidelines and Pharmacovigilance Program India - Indian Pharmacopoeia Commission, Ghaziabad.

Variables	Doctors		Nurses		Class IV		Pharmacists		Police Personnel	
	Knowledge									
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Were you informed about HCQS	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)
Informed ADRs	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)
Pre HCQs-Screening	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100)	0 (0 %)
Attitude										
PvPI-AMC reminder for HCQ Adherence	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)
Practice										
Completed HCQ Course for 7 weeks	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)
Post HCQ Screening With RT-PCR	250 (100 %)	0 (0 %)	450 (100 %)	0 (0 %)	550 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)	50 (100 %)	0 (0 %)
Out of 1350 subjects Adverse Drug Reactions Reported										
Total No. Reported	**4 (1.6 %)**		**0**		**0**		**0**		**0**	
Type of ADRs	Mild, Probable and Preventable		Nil		Nil		Nil		Nil	

Table 4. Knowledge, Attitude and Practice on HCQ Prophylaxis among Frontline Health Care Workers and Police Personnel

All the participants were followed for 7 weeks and assessed on completion of the course with repeat investigations and Fundal examination. All the suspected ADRs were reported to ADR monitoring cell using yellow forms and entered in CDSCO forms. Causality assessment of ADRs is done by WHO-UMC Scale, for severity of ADRs with Hartwig Seigel Scale and preventability of ADRs using Schummont Thornton Scale.[15] All the suspected ADR patients were treated accordingly by stopping the drug and were administered with antihistaminics and Injection Hydrocortisone 100 mg. At the end of 7 weeks all 1350 participants were subjected for RT-PCR (Reverse transcription polymerase chain reaction) tests, which were provided by AP Government at free of cost.

Data Collection and Statistical Analysis

Study was briefed in advance to the field staff and trained to collect data separately for general population and for frontline health care workers and police personnel by taking precautions and standardize the information collection process in order to maximize reliability and minimize the bias. Questionnaire required 10 minutes on an average for completion by the participant. The collected data were coded, complied, entered in EXCEL spread sheet and data cleansing was done to rule out data duplication. Data imported into SPSS version-22 software. Results were tabulated and statistically analyzed to obtain frequency tables along with their percentages and cross tabulated using Pearson's chi square test. A p-value of less than 0.05 were considered as statistically significant.

RESULTS

In a total of 1734 subjects males were 811 (46.77 %) and females were 923 (53.23 %) (Table 1). Majority belonged to 38 - 47 years 807 (46.5 %) and 28 - 37 years 438 (25.2 %), 48 - 57 years 3.1 (17.3 %). Knowledge regarding corona spread for general population revealed that 152 (39.6 %). 180 (46.9 %) knew only prevention is better and 157 (40.9 %) knew that there is no specific treatment. 36 (9.4 %) had knowledge on Aarogya Setu App.

Attitude towards washing hands, 114 (29.7 %) used both soap water and hand sanitizer. 114 (29.7 %) had attitude to follow hand washing after every activity. 261 (68 %) covered themselves using all methods. 290 (75.5 %) had attitude to follow social distancing. 248 (64.6 %) were staying at home. 11 (2.9 %) had attitude of using Aarogya Setu App for protection. 279 (72.7 %) were practicing all measures. 249 (64.8 %) practiced regular hand washing. 269 (70.1 %) were wearing masks. 234 (61 %) were maintaining social distancing 268 (69.8 %) were staying at home. 12 (3.1 %) were following Aarogya Setu App (Table 2). The results obtained in this table helps in assessing the behaviour gap between knowledge and practice followed by the participants in the study on various factors that mitigate on corona spread like wearing face mask ($p = 0.101$) showing statistically not significant, following hand washing ($p = 0.002$) showing statistically significant, maintaining social distancing ($p = 0.035$) showing statistically significant, staying at home ($p = 0.005$) showing statistically significant and usage of Aarogya Setu app ($p = 0.559$) showing statistically not significant (Table 3). 1350 (100 %) participants had knowledge on HCQ prophylaxis. 1350 (100 %) had attitude for HCQ course completion. Post HCQ course was subjected for RT-PCR test found negative. Among 1350 (100 %), 4 (1.6 %) have shown mild, probable and preventable type of ADRs (Table 4).

DISCUSSION

In this study 923 (53.23 %) female participated which is more than 811 (46.77 %) males. Majority of participants were 38 - 47 years 807 (46.5 %) followed by 28 - 37 years 438 (25.2 %) similar to Joseph T F Lau et.al, study during 2004. This study showed 152 (39.6 %) respondents had knowledge on disease spread which is more compared to the study conducted by Huda F. Abbag during 2017 in general population found to be 19.5 % had knowledge on MERS-CoV, in Ahba, Saudi Arabia and concluded that poor knowledge was the cause for rapid spread of disease and could be the same in Nandyal.[16] 155 (40.45 %) knew that virus can spread by touching surfaces, and 3 (0.8 %) knew that virus can survive few hours to several days. 248 (64.6 %) had knowledge on corona signs, 47 (12.2 %) knew about symptoms and 180 (46.9 %) had knowledge that prevention is the only way and 194 (50.5 %) had knowledge on quarantine. One of the challenges in fighting against COVID - 19 is that we have little knowledge on the pathogen and pathogenesis.[17] Though Government of India is spreading message about importance of mobile app among community to adopt, so as to minimize the mobility and to identify the

COVID cases to interrupt further transmission, only 36 (9.4 %) of people are having knowledge on Aarogya Setu App application.[18] 142 (37 %) respondents had attitude on washing hands with soap and water, 114 (29.7 %) used both soap and water along with hand sanitizer. 114 (29.7 %) washed hands regularly.[19] 261 (68 %) thought to cover face wearing mask, handkerchief or with elbow. 290 (75.5 %) had attitude for social distancing and 248 (64.6 %) to stay at home and 11 (2.9 %) thought to follow Aarogya Setu App, which is very poor.[18] 279 (72.7 %) practiced hand wash, wearing mask, maintaining social distancing and staying at home. 249 (64.8 %) followed regular hand washing is less compared to Issac et. al, 2003 study, where in 75.9 % were washing hands regularly among general public of Hong Kong.[20] 269 (70.1 %) were wearing mask, majority were from 28 - 47 years (115 + 88 = 203 [75.5 %]), found significantly high in younger age group compared to the Tang et, al. study, where elderly above 50 years (68 %) were wearing masks. The worst affected people in this situation is only elderly may be due to less usage of face mask in Nandyal.[21] Shin Wei Sim et, al. 2014 concluded that usage of face mask helps in prevention of respiratory infections, at present COVID-19 spread can be controlled from lessons learned from SARS epidemic.[22] 234 (60.9 %) were maintaining 2-meter social distancing and 268 (69.8 %) were strictly following staying at home during lockdown period. Wang et, al. concluded that in his phase-adjusted estimation in number of COVID cases in Wuhan suggested, that following preventive measures like maintaining social distance and staying at home has reduced the human-to-human contact and found less spread of infection.[23] Study from Savi Maharaj et. al, proved using graphic representation showing that social distancing by one group has reduced the spread of infection compared to other who did not follow.[24] Prevalence of practicing mobile app, Aarogya Setu is 12 (3.1 %), which is very less and shows people have no interest in using app rather interested in other social apps is showing inequalities among the community, which have to be answered and could be reason for spread of COVID-19 in Nandyal.[25]

As part of preventive measures in community among frontline health care personnel along with policemen posted for COVID duties were considered for HCQ prophylaxis orally by advisory released by ICMR in support with National Pharmacovigilance Program of India during March 2020, [26,27] 1350 (100 %) participants were having knowledge about the HCQ prophylaxis, were informed about the safety efficacy, adverse drug reactions, were subjected for pre-screening examination and tests like ECG, Serum Creatine, Blood Urea, RBS, LFT and rapid COVID test before administration of drug. 1350 (100 %) had attitude for HCQ course adherence towards completion, were motivated to maintain attitude to HCQ course adherence by PvPI (Pharmaco-Vigilance Programme of India) -AMC, Santhiram Medical College Center using mobile App, calls and through messages were monitored for complete 7 weeks for prophylaxis. On completion of 7 weeks of HCQ course which was dose monitored within the therapeutic dose for prophylaxis had no complications. Among 1350 participants 4 (1.6 %) have shown mild and probable type of ADRs (nausea, gastric irritation and giddiness) according to WHO-UMC Scale, for severity with Hartwig Seigel Scale and preventability of ADRs is done using Schummont Thornton Scale. The percentage of adverse effects was less than the data provided by PvPI safety Profile of HCQ in revised advisory.[27] Myron S concluded that healthcare workers on prophylactic HCQ on asymptomatic persons had less chance of COVID infection.[28] All respondents found negative for RT-PCR COVID 19 on completion of 7 weeks HCQ course, proving effective outcome as prophylactic measure in preventing spread among frontline personnel posted in COVID 19 emergency duties.

Limitations

More number of studies are required across the country with regard to hand washing, social distancing, wearing masks, staying at home and regarding usage of Aarogya Setu app among the general population. This study should have included more participants from all corners of the community like all professionals, businessmen, traders, healthcare workers, police departments, frequent travellers, scavengers, animal handlers, butchers, etc.

CONCLUSIONS

This study helps us to understand the need for increase in preparedness and response actions to be designed for general population to prevent transmission of the disease. 39.6 % had knowledge with regard to COVID, 68 % had attitude to fight against infection, 72.7 % were practicing preventive measures. 3.1 % were using Aarogya Setu App, which is very low among general population and this need to be addressed to attract more people to use the app. HCQ prophylaxis given to frontline healthcare personnel, pharmacists and police have given good results in the prevention of transmission. Proper screening, guidance and monitoring from pharmacovigilance center helped all high-risk frontline personnel, and they were found to be negative by RT-PCR tests for corona infection. The ADRs reported were probable, mild, preventable and were managed in time.

Recommendations

- Need more of effective COVID awareness programs to reach all corners of the community.
- Need to learn more from failures of the other affected countries.
- Need to adopt traditional (Indian and Japanese) cultural practices, to prevent spread of communicable diseases.
- Share and learn more live experiences from persons who recovered from infection.
- Regular administration of Vitamin A, B, C, D and Zinc would provide good immunity, which is cost effective.
- Regular hand washing and wearing face mask would help to prevent all droplet borne communicable diseases.

- Modified version is needed for Aarogya Setu App, so as to attract more people to use it.
- Promote more research studies for better quality of life for future mankind.

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