A Study of Epidemiological Profile and Outcome of Covid Positive Patients Advised Home Isolation from Tertiary Care Hospital.

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ABSTRACT

Introduction:The worldwide pandemic caused by COVID-19highly infectious double mutant variant of SARS-CoV-2 (B.1.617 lineage) attributed to sudden surge of cases in India and was challenged by acute shortage health care personnel and medical equipment required for severe cases treatment like ventilators, ICUs. Isolation is the oldest communicable disease control measure and isolating sources of infection is key measure to break the transmission chain. Advanced medical resources are not required for mild symptomatic patientsbut isolation is needed. The data on the compliance to guidelines and outcome at the end of isolation are scanty in the literature.

Material & Methods: A community based cross-sectional study was conducted in asymptomatic and mild symptomatic patient advised home isolation.Information about symptoms, socio-demography, outcome at the end of home isolation and guidelines followed were taken by telephonic interview of 301 patients.

Results:

Out of 301 home isolated patients 28% completed home isolation without any symptoms, 64% completed with resolved symptoms, 8% required hospital admission during home isolation period. Majority were mild symptomatic 216(71.77%) and 85(28.23%) were asymptomatic.

Conclusion:Home isolation for asymptomatic and mild symptomatic patient is useful for both patients and health care system.Majority of patients recovered well in home isolation. But, mass public education about infection prevention and control measure to reduce transmission among household members is needed.

Keywords: COVID-19, home isolation, SARS-CoV-2, outcome.

Introduction

A worldwide outbreak of a respiratory illness Caused by a novel coronavirus, SARS-CoV-2, first detected in December 2019 in Wuhan city of China. Within few weeks, it has spread globally and became global pandemic. In April-May 2021, India has experienced a catastrophic second wave of COVID -19 pandemic, this outbreak is much more serious than first wave of pandemic and placed great burden on the Indian health systems. [1] The sudden surge in the number of cases attributed to a highly infectious double mutant variant of SARS-CoV-2 (B.1.617 lineage) in India, which is more pathogenic than the initial strain. [2]

Due the sudden surge of cases the provision of health care was challenged by major problems such as acute shortage of hospitals beds, skilled health care workers, medicines, medical oxygen, supportive equipment needed to treat severe cases of the disease such as ventilators, ICUs across the country. Isolation is the oldest communicable disease control measure.it is defined as the separation for the period of communicability of infected person or animals from others in such places and under such condition, as to prevent or limit the direct or indirect transmission of the infectious agent from those infected to those who are susceptible, or who may spread the agent to others. [3] To allocate medical resources efficiently, at the time of first wave of covid-19 WHO [4] given home isolation guidelines. The guidelines of home isolation given on 2 July 2020 by Government of India Ministry of Health & Family Welfare, and again revised on 28 April 2020 for management of asymptomatic/ mild symptomatic Covid 19 positive cases. [5]

Isolating sources of infection remains an important measure to break the chain of transmission and control this pandemic. The patients with mild symptoms do not require advanced medical resources, although they require isolation to prevent transmission. Care of asymptomatic and mild symptomatic patients in home isolation is become a supplemental

component of healthcare services and significantly lightened the load on the health system. The outcome at the end of home isolation is very important to evaluate the effectiveness of program. The present study aimed to assess the outcome of patients in home isolation at the end of home isolation period. The data on the clinical features, compliance to guidelines and outcome at the end of isolation of subjects with SARS-CoV-2 infection in home isolation are scanty in the literature. We described the epidemiological and clinical characteristics of patients with confirmed COVID-19 infection. The result of this study showed how many people followed the actual guidelines of the home isolation and helped in halting spread of dreadful Covid -19 pandemic. The evidence from this study could help to design better plans and preventive strategies for the future. We believe that the findings of this study will be much helpful to public health personal, clinicians, health policy makers who are involved COVID-19 pandemic planning and response.Current study was undertaken at tertiary care centre in the Maharashtra state, India with following objectives:

i.   To study the epidemiological profile of COVID 19 positive patient in home isolation.

ii. To study the outcome of COVID 19 positive patient in home isolation at the end of home isolation period.

iii. To study the association between sociodemographic factors and outcome at the end of home isolation.

Materials and methods

A community based retrospective cross-sectional study was conducted after obtaining Ethics Committee clearance (IEC). The data of laboratory confirmed (RTPCR & RAT) and home isolation advised COVID -19 cases between 1st March to 30th June 2021was collected from tertiary care hospital. Home isolation is advised by physicians working in fever clinic. Home

isolation advised to asymptomatic, mild symptomatic patients after obtaining the undertaking from patients which includes they will follow all the guidelines given by government of India. Also Patient and caregivers advised about if they feels any difficulty in breathing, decrease in oxygen saturation < 94% on room air, persistence pain in the chest, mental confusion, inability to arouse then immediately visit to hospital. End of isolation period was after 10 days from the onset of symptoms or from date of sampling for asymptomatic cases and no fever for 3 days. [6] Informed written consent was procured from all the patients.In case the study subject is less than 18 years, informed consent was taken from the parents/guardian and assent was taken from the subject.

Inclusion criteria: The patients those who were willing to answer questions related to home isolation.

Exclusion criteria: The patients those were not willing during oral telephonic consent, unable to reach 3 separate attempts, wrong contact number.

The confidential interviews of 301 case out of 370 was carried with the help of structured questionnaire telephonically by the trained staff of department of Community Medicine after taking their verbal informed consent. . It consist of the information about socio demographic and covid-19 disease characteristics, covid-19 vaccination, home isolation guidelines followed, outcome at end of isolation period and other relevant environmental history has been taken.

Criteria for home isolation

Asymptomatic case: A laboratory confirmed cases not experiencing any symptoms and having oxygen saturation at room air of more than 94%. [5]

Mild symptomatic case: Clinically assigned mild cases are patients with upper respiratory tract symptoms (&/or fever) without shortness of breath and having oxygen saturation at room air of more than 94 %. [5]

Ethical Considerations

Permission of Institute Ethical Committee (IEC) was taken. A written informed consent was obtained from all participants by sending it through email. Study participants, whose age is less than 18 years, assent was taken from the study participants. Full confidentiality of respondent's information was kept and information was used only for research purpose.

Data Analysis

Microsoft excel was used for data entry. The data was tabulated and analysed using SPSS version 23. Chi-square test has been used to test the significance of outcome at the end of home isolation period in the covid-19 positive patients advised home isolation in association with various sociodemographic factors. A p-value less than 0.05 considered as significant.

Result

In this study, the majority 188(62.4%) of case between 21-40 years of age with mean age of 34.69 $\pm$ 12.62 years. In 301 laboratory confirmed covid-19 cases interviewed telephonically 253(84.1%) RTPCR positive, 152(50.5%) Males, 277(92%) from urban area, 269 (89.4%) were Hindu, 122(40.5) belong to class II and 110(36.5) belongs to class IV socioeconomic status, 262(87%) had h/o Contact with COVID -19 case, 4 (1.3%) case had history of previous COVID-19 infection, 91(30.23%) cases were HCW.

The duration of symptoms was 1-20 days with mean 8.99$\pm$ 3.64 days and majority were 133(44.18%) had symptoms for 6-10 days. The duration of difference between onset of symptoms and isolation was 1-8 days with mean 2.94$\pm$1.55 days and among 216 mild symptomatic 93(30.9%) cases isolated within 1-2 days after onset of symptoms. Majority

159(52.8%) were graduated, 199 (66.1) were married, 215(71.4%) were living in nuclear family, 251(83.4%) live with 3-6 family members, in 117(38.9%) cases 1-2 family members came covid-19 positive. Study participant's outcome at the end of home isolation showed in figure 1. No any death reported during isolation period.

Fig.1 outcome of home isolated patient at the end of home isolation
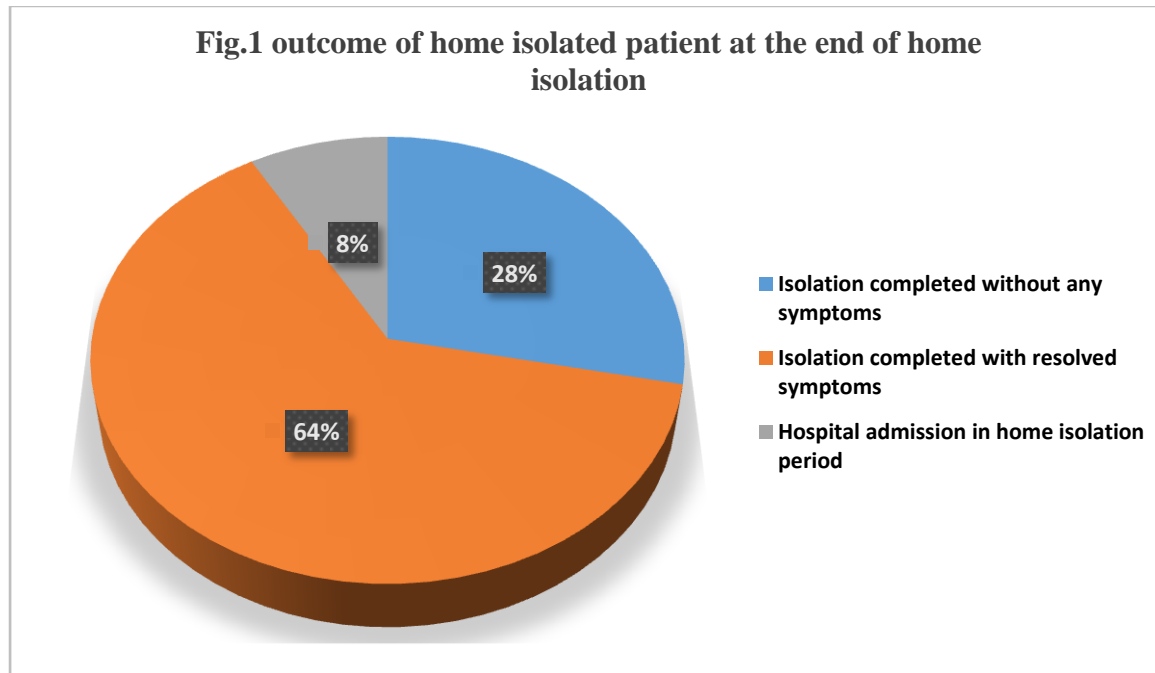
The clinical profile of cases were in home isolation showed in table 1. the majority were mild asymptomatic 216(71.77%). Most common symptoms were fever, cough, cold followed by sore throat, headache, weakness, loss of taste and smell. Most common comorbidity were hypertension. 25(8.3%) cases were admitted during home isolation period.

Table 1: Clinical profile of home isolated cases	
Particulars	**Cases (%)** **n= 301**
Clinical status at the time of diagnosis	
Asymptomatic	85(28.23)
Mild symptomatic	216(71.77)
Symptoms(n=216)	
Fever	210(97.22)
Cough	168(77.77)
Cold	122(56.48)
Body ache	106(49.07)

Sore throat	55(25.46)
Headache	37(17.12)
Weakness	34(15.74)
Loss of taste and smell	28(12.96)
Vomiting	6(2.75)
Breathlessness	5(2.31)
Diarrhoea	3(1.38)
Chest pain	2(0.92)
Comorbidity	
Hypertension	37(12.29)
Diabetes	16(5.31)
Thyroid disorder	9(2.99)
CVA	1(0.33)
GI cancer	1(0.3)3
Heart disease	1(0.33)
Psychiatric disorder	1(0.33)
Addiction	
No	169(56.1)
Smoking	36(12)
Drinking	75(24.9)
Smoking and drinking	21(7)
COVID-19 vaccination	
Not taken	231(76.7)
One dose	38(12.6)
Two dose	32(10.6)
Type of treatment taken	
Allopathic	107(35.5)
Home remedies + allopathic	123(40.9)
Home remedies+ allopathic+ Ayurveda	71(23.6)

Regarding compliance to the recommended public health measures among home isolated patients, 71(23.6%) had an individual room available with attached toilet facility, 222(73.8%) stayed in adequately ventilated rooms, overcrowding were present in 77(25.6%) patients home, 120(39.9%) followed social distance with family members, 84 (27.9%) had taken health care advice from HCWs, 250(83.1%) patients used mask, 285(94.7%) care givers used mask, 133(44.2%) were monitored the symptoms during isolation period, Majority had face mask, sanitizer and medical equipment's like thermometer(47.8%), pulse oximeter(51.1%) for monitoring.

When the age factor of home isolated patients studied, it was found that the outcome was significantly associated with age (P=0.0001) i.e 20(23.5%) patients with > 40 years of age group were hospitalised during the home isolation period. The reason for admission were persistence of high grade fever, breathlessness, chest pain. In this study, very high statistical difference was found among outcome and marital status (P=0.001), occupation and outcome (P=0.001) i.e in majority professional 63(65.6%), skilled workers 48(78.7%) symptoms were resolved but 8(24.2%) patients hospitalised were unskilled worker. there was a significant association between type of family (P=0.05), number of family member (P=0.017) and education (P=0.057) of patients.(Table 2)

Table 2: Sociodemographic Factors Affecting outcome of home isolated covid-19 cases.						
Parameter		**Isolation completed without any symptoms(n = 85)**	**Isolation completed with resolved symptoms(n= 191)**	**Hospital admission in home isolation period (n= 25)**	**Chi-square**	*P value*
Age (years)	< 20	13(46.4)	14(50)	1(3.6)	41.05	0.0001
	21 – 40	51(27.1)	133(70.7)	4(2.1)		
	>40	21(24.7)	44(51.8)	20(23.5)		
Gender	Male	38(25)	98(64.5)	16(10.5)	3.014	0.222
	Female	47(31.5)	93(62.4)	9(6)		
Socioeconomic status	I	3(18.8)	12(75)	1(6.2)	9.796	0.134
	II	32(26.2)	82(67.2)	8(6.6)		
	III	19(35.8)	33(62.3)	1(1.9)		
	IV	31(28.2)	64(58.2)	15(13.6)		
Education	Illiterate & primary	9(52.9)	7(41.2)	1(5.9)	9.166	0.057
	Middle to intermediate	27(26.2)	63(61.2)	13(12.6)		
	Graduation to post graduation	49(27.1)	121(66.9)	11(6.1)		
Occupation	Professional	27(28.1)	63(65.6)	6(6.2)	24.84	0.001
	Skilled work	10(16.4)	48(78.7)	3(4.9)		
	Unskilled work	5(15.2)	20(60.6)	8(24.2)		
	Unemployed	43(38.7)	60(57.1)	8(7.2)		
Marital status	Married	57(28.6)	121(60.8)	21(10.6)	23.34	0.001

	Unmarried	26(27.1)	69(71.9)	1(1)		
	Widow	2(33.3)	1(16.7)	3(50)		
Type of family	Nuclear	53(24.7)	146(67.9)	16(7.4)	9.510	0.050
	Three generation	28(40.6)	33(47.8)	8(11.6)		
	Joint	4(23.5)	12(70.6)	1(5.9)		
Number of family members	1 – 4	46(23.1)	137(68.8)	16(8)	8.197	0.017
	5 -8	39(38.2)	54(52.9)	9(8.8)		

*Others- Muslim, Sikh, Christian.

The hospitalization during isolation period was higher among the longer total duration of symptoms and statistically significant (P= 0.001). Very high statistical significant difference was found among the presence of comorbidity (P= 0.001), addiction (P=0.003) and outcome. In majority of patients 1 or 2 family members affected with covid-19 than 3 and more family members (p=0.049) after home isolation. (Table 3)

Table 3: Characteristics COVID-19 infection affecting outcome of home isolated covid-19 cases.						
Parameter		**Isolation completed without any symptoms (n= 85)**	**Isolation completed with resolved symptoms(n= 191)**	**Hospital admission in home isolation period (n= 25)**	**Chi-square**	*P value*
Family member affected with COVID -19	YES	28(20.1)	97(69.8)	14(10.1)	8.594	0.014
	NO	57(35.2)	94(58)	11(6.8)		
Number of family member affected with COVID -19	1	13(18.1)	54(75)	5(6.9)	9.531	0.049
	2	10(22.2)	32(71.1)	3(6.7)		
	3 & more	5(22.7)	11(50)	6(27.3)		
H/o Contact with COVID -19 case	Yes	77(29.4)	165(63)	20(7.6)	2.120	0.347
	No	8(20.5)	26(66.7)	5(12.8)		
Symptom duration (Days)	1 – 10	0	163(95.3)	8(4.7)	38.13	0..001
	11 – 20	0	28(62.2)	17(37.8)		
Period between onset of symptoms and isolation (Days)	1 – 4	0	163(89.1)	20(10.9)	0.487	0.553
	5 -8	0	28(84.8)	5(15.2)		
Past history of COVID-19 infection	Yes	0	4(100)	0	2.335	0.311
	No	85(28.6)	187(63)	25(8.4)		
Covid vaccination	Yes	18(25.7)	48(68.6)	4(5.7)	1.320	0.517
	No	67(29)	143(61.9)	21(9.1)		
Addiction	Yes	29(22)	85(64.4)	18(13.6)	11.34	0.003

	No	56(33.1)	106(62.7)	7(4.1)		
Comorbidity	Yes	13(22)	31(52.5)	15(25.4)	28.26	0.001
	No	72(29.8)	160(66.1)	10(4.1)		

Hospitalization of patients were more among the patients having 1-2 rooms and 3 rooms compared with 4-5 rooms (P= 0.001) and that was statistically significant. Compliant to Regular health care advice taken (P=0.014), Regular monitoring of symptoms (0.001), Use of mask by patient (P=0.001) was significantly associated with outcome at the end of home isolation. (Table 4)

Table 4: Compliance with Home isolation guidelines affecting outcome of home isolated Covid-19 cases.

Parameter		Isolation completed without any symptoms(n= 85)	Isolation completed with resolved symptoms(n= 191)	Hospital admission in home isolation period (n= 25)	Chi-square	*P value*
Total no. of room	1-2	17(31.5)	32(59.3)	5(9.3)	19.37	0.001
	3	30(18.5)	117(72.2)	15(9.3)		
	4-5	38(44.7)	42(49.4)	5(5.9)		
Separate room attached with toilet	Yes	23(32.4)	43(60.6)	5(7)	0.869	0.648
	No	62(27)	148(64.3)	20(8.7)		
Ventilation	Adequate	59(26.6)	145(65.3)	18(8.1)	1.329	0.515
	Inadequate	26(32.9)	46(58.2)	7(8.9)		
Overcrowding	Present	25(32.5)	46(59.7)	6(7.8)	0.913	0.634
	Absent	60(26.8)	145(64.7)	19(8.5)		
Social distance followed	Yes	33(27.5)	76(63.3)	11(9.2)	0.217	0.897
	No	52(28.7)	115(63.5)	14(7.7)		
Regular health care advice taken	Yes	14(16.7)	60(71.4)	10(11.9)	8.51	0.014
	No	71(32.7)	131(60.4)	15(6.9)		
Regular monitoring of symptoms	Yes	22(16.5)	100(75.2)	11(8.3)	16.71	0.001
	No	63(37.5)	91(54.2)	14(8.3)		
Use of mask by patient	Yes	57(22.8)	170(68)	23(9.2)	21.68	0.001
	No	28(54.9)	21(41.2)	2(3.9)		
Use of mask by care giver	Yes	81(28.4)	180(63.2)	24(8.4)	0.223	0.894
	No	4(25)	11(68.8)	1(6.2)		

Discussion:

The novel corona virus disease 2019 has posed threat to all human across the globe. Due to sudden surge of cases during second wave of covid-19, to allocate the medical resources efficiently Union Health Ministry has given the guidelines for home isolation for that patients with asymptomatic /mild symptoms do not require advanced medical resources, although they require isolation to prevent transmission. As the scarcity of data, we evaluated the sociodemographic profile, clinical features, compliance to guidelines and outcome of covid-19 patients who were home isolated. In this study 85(28.23%) were asymptomatic and 216(71.77) were mild symptomatic at the time of diagnosis. Mild symptomatic patients was higher than the another study done in Pune[7] shows 340(53.2%) and in Nepal 183 (34.1%) [8].The sudden surge in the number of cases attributed to a highly infectious double mutant variant of SARS-CoV-2 (B.1.617 lineage) in India, which is more pathogenic than the initial strain. [2] The patients advised home isolation majority were younger age had less comorbidity and older age was associated with severe form of disease (P= 0.0001). Similar result showed in studies conducted in Italy [9] and China[10]. Study showed the most common clinical feature were fever 210 (97.22%), cough 168(77.77%), cold 122(56.48%) similar with study from Pune fever 168(49.4%), cough 160 (47.1%), cold (13.1%) [7] Andfrom Nepal fever 121(22.6%), cough 104 (19.4%), cold 86(16.1%) [8] Other symptoms like sore throat, body ache, loss of taste and smell, diarrhoea, vomiting, weakness were present. The literature shows the association between presence of comorbidity and severe disease. Study conducted in china showed that comorbidities were present in nearly half of hospitalized patients, with hypertension being the most common, followed by diabetes and coronary heart disease. [10] This study shows the Hypertension 37(12.29%) was the most common comorbidity followed by diabetes 16(5.31%) and statistical significant association with outcome (P=0.0001).

As the Majority of patients were mild symptomatic among them 191(64%) completed home isolation period with resolved symptoms, 85(28%) completed home isolation period without any symptoms, 25(8%) required hospital admission due to deterioration of health during isolation period. In a study from Saudi Arabia conducted among 5368 covid-19 patient in 2020, 5% patients required hospitalization [6] and one small study conducted in turkey in 2020 shows hospitalisation required in 9.8% patients.[11] Another study conducted in April- May 2021 during second wave of pandemic from Tamil Nadu shows 1825 (93.3%) successfully managed at home, 132 patients (6.7%) who failed Home Isolation, 57 (43.2%) required oxygen therapy and 23 needed intensive care admissions. [12] Presence of comorbidity and older age were associated with hospitalization.

The country like India which has rich history of traditional medicine like Ayurveda. Many peoples use home remedies like salt water gargle, intake of warm water for common health conditions like fever, cold, cough. They use natural products like ginger, cinnamon, turmeric, lemon, black pepper, basil leaves, and garlic to make kadha. They have been scientifically proven to have therapeutic benefits against acute respiratory tract infections and they act as an immunity booster. [13] In our study 107(35.5) used only allopathic medicine, 123(40.9) used home remedies and allopathy, 71(23.6) used home remedies, Ayurvedic treatment and allopathy medicine. Study conducted in Nepal shows the 393(39.1%) used home remedies, 352(35%) used Ayurvedic treatment, 112(11.1%) used allopathic medicine. Another study conducted in India on use of complementary and alternative medicine (CAM) and home remedies on 495 covid-19 infected patients from isolation centre showed that 295(59.6%) used Ayurvedic kadha, 128(25.8) used CAMs or home remedies. [14]

Regarding compliance to home isolation guidelines 250(83.1%) patients used mask, 285(94.7%) care givers used mask, 133(44.2%) were monitored the symptoms during

isolation period but 71(23.6%) were stayed in separate room, 77(25.6%) were stayed in overcrowded room, 120(39.9%) followed social distance. Adequate health education and sensitization of people about infection prevention and control measures is needed to prevent the transmission of infectious disease among household members study because showed that there was breach in the compliance to guidelines. The study conducted among home isolated patients in Spain shows that 95% had separate room available and well ventilated. In caregivers 80% followed hand hygiene, 48.9% used gloves, 60% used mask. [15]

There is many advantages of the home isolation strategy to manage the stable patients like less stress and anxiety, emotional and psychological support from family members which helps in recovery. The benefits for health system are less cost required to manage patients and they can divert the trained health personnel, medicines, medical equipment towards management of severe complicated cases. But the disadvantages like spread of infection in the household and community if guidelines are not followed appropriately.

In our study, main limitation was recall bias by patients as the study conducted after large duration of completion of home isolation period.

Conclusion:

Home isolation for asymptomatic and mild symptomatic patient is useful for both patients as well as health care system. There is need of mass public education about infection prevention and control measure to reduce transmission among household members and monitoring of such program by government, health policy makers to achieve success.

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