Comparison of Covid-19 RT-PCR Results in Different Age Groups during 6 Months Period at a Tertiary Care Centre

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Abstract

Background- *The new pandemic caused by COVID-19 (SARS CoV-2) originated at Wuhan, China became the public health crisis throughout the globe. Susceptibility to this airborne infection is low in children when compared to adults due to nonspecific protection resulting from recent infection by other respiratory viruses, which children experiences more frequently than adults.*

Material And Methods: *Reverse transcriptase Polymerase Chain Reaction testing (RT-PCR) was done on 4617 nasopharyngeal & oropharyngeal swab specimens received along with sample reference form received at SRRIT & CD Hyderabad from May 2020 to October 2020 and the results were evaluated.*

Results: *Among 4617 sample 1722(37%) shows positive results for COVID-19by RT-PCR of which 1056 (61.3%) were males and 666 (38.7%) were females. Highest positive rate was noted in the month of June 528(53%) and least in October 152 (24.3%).Predominant age group affected was 31-45 years 587 (34%) and least affected age group was 0-15 years 100 (6%).*

Conclusion: *The clinical features and prognosis of the disease vary among patients of different ages and a thorough assessment of age may help clinicians to establish the risk stratification for all COVID-19 patients.*

KEYWORD: *COVID-19, Pandemic, RT-PCR,SARS CoV-2.*

I. Introduction

In today's scenario, the human race is panicked due to an alarming situation of the recent pandemic of COVID-19[1]Coronavirus disease 2019 (COVID-19) is a highly infectious respiratory inflammatory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2[2]. COVID-19 came into the country with the movement of International passengers and gradually made its way in the country [3]. WHO published that this COVID-19 virus is airborne and can spread through breathing or even just talking. The initial symptoms of COVID-19 virus infection were found to be cough, sore throat, fatigue, which could lead to fever, diarrhea, and malaise among others [1]. In India, the first case of COVID-19 was detected on Jan 30, 2020. Until Mar 1, 2020, India had only three confirmed cases but ever since the contagious infection has grown exponentially[4]. As SARS-CoV-2 is rapidly spreading all over the world, it is predicted that patient's sex, age, and comorbidity might render these patients more vulnerable to either increased mortality or increased risk of infection[5]. Majority of the cases among children are more than 5 years of age. There are very few cases reported in children less than 5 years of age which may be due to non-specific protection resulting from recent infection by other respiratory viruses [3,6]. There are several likely biological explanations for why COVID-19 is more deadly for older persons, and why older people have much higher death rates no matter what the level of overall infection is. The first is that older persons may be more vulnerable to getting the disease when exposed to the virus because of changes in the immune system with age. As age increases, the availability of naive T cells and the ratio of CD4/CD8 T cells to address any new pathogen become depleted, and this depletion has been linked to poor responses to COVID-19. A third factor making COVID-19 more serious for older persons is that they are more likely to have underlying conditions, such as heart disease, hypertension, diabetes, and lung disease, and COVID-19 mortality is higher for those with underlying conditions[7]. In this study we have evaluated the COVID-19 RT-PCR results among different age groups and gender, as assessment of age may help clinicians worldwide to establish risk stratification for all COVID-19 patients.

II. Material And Methods

The present cross sectional comparative study was conducted at Sir Ronald Ross Institute of Tropical & Communicable disease (SRRIT&CD), Hyderabad, India for a period of 6 months from May2020 to October2020 after obtaining institutional ethical committee approval. Symptomatic patients and asymptomatic contacts of all age groups & both gendersreferred for COVID-19 by RT-PCR with ICMR referral form signed by the authorized clinician were included.

Both Nasopharyngeal& oropharyngeal specimens (NPS) from the patients were collected in a sterile viral transport media. The collected specimen were subjected for RNA extraction and RT-PCR to detect the E, RdRP& ORF gene targets of SARS-CoV-2 along with an internal quality control for confirming the adequacy of the sample.The results were interpreted as positive or negative by considering amplification threshold using cut off value ≤ 35 as per the manufacturer's instructions.

III. Results

A total of 4617 samples were tested by RT-PCR during 6 months period. Maximum number of samples were tested in the month of July 2020 accounting to 24% (n=1126) followed by June, August, September and October that is 22%, 18%, 16%, 13% respectively and least were tested during the beginning of pandemic in the month of May 2020 accounting to 7%. Out of total tested 1722 (37%) were positive and 2895 (63%) were negative. Among the 1722 confirmed positive cases males preponderance was observed 61.3% (n=1056) and females were 38.7% (n= 666). Highest positive rate was noted in month of June 528(53%) followed byAugust July, September, May & October which are 38.8%, 35.6%, 33%. 25%, 24.3% respectively [figure-1]. Month and gender wise distribution of positive cases shown in [figure-2]. Among the different age groups most common age affected was 31-45 years, 587 (34%) followed by 16-30 years 569 (33%), 46-60 years 348 (20%), > 60 years 118 (7%) and the least affected age group were of children 0-15 years of age 100 (6%) [figure-3]. Age and gender wise distribution of positive cases shown in [table1]

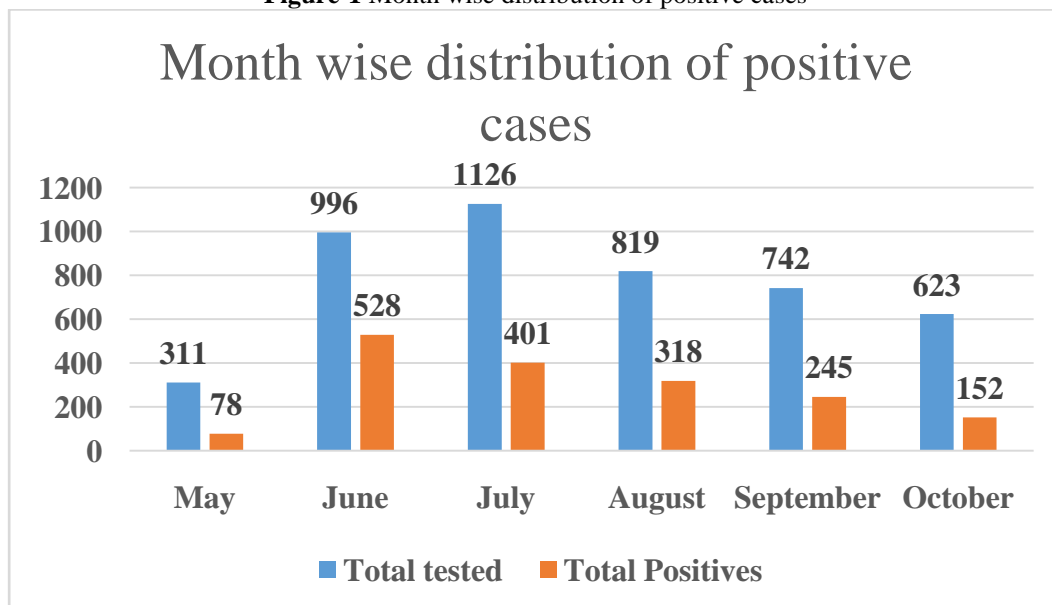**Figure-1** Month wise distribution of positive cases

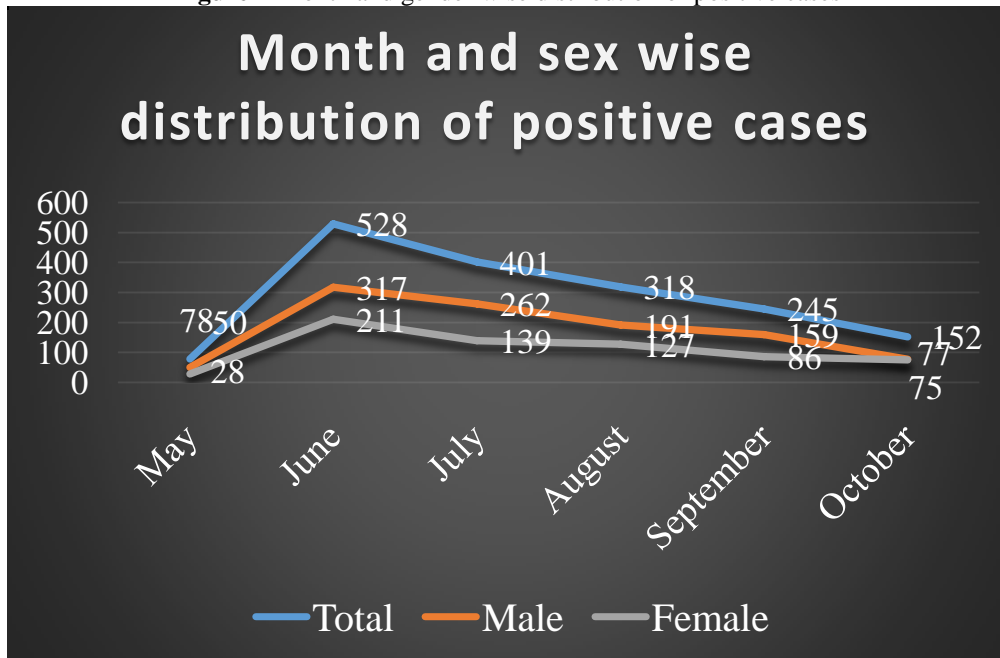**Figure-2** Month and gender wise distribution of positive cases

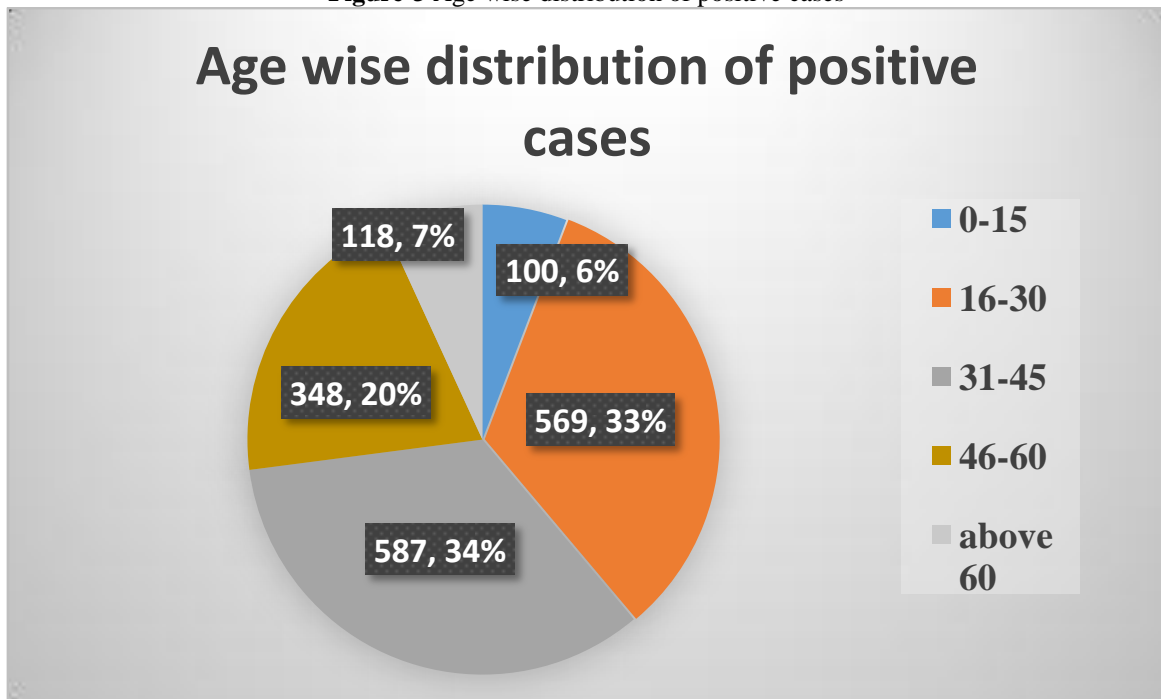**Figure-3** Age wise distribution of positive cases

Table-1 Age and gender wise distribution of positive cases

Age in years	May (78)		June (528)		July(401)		August (318)		September (245)		October (152)		
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**Total**
0-15	5	--	7	11	12	12	14	14	8	7	3	7	**100 (6%)**
16-30	15	10	90	**110**	75	38	57	47	48	27	26	26	**569 (33%)**
31-45	20	5	**150**	45	96	40	68	36	57	25	25	20	**587 (34%)**
46-60	5	5	45	35	64	37	40	21	37	23	18	13	**348 (20%)**
>60	5	3	25	10	15	12	12	9	9	4	5	9	**118**

												(7%)
Total	50	28	317	211	262	139	191	127	159	86	77	75	1722

IV. DISCUSSION

The gendered impacts of COVID-19 outbreak need to be effectively analysed for potential public health and policy inferences. In the Indian context, it is evident that bulk of infections and deaths are among males and part of the explanation may be found in the gendered nature of work and society in India. Men are relatively more likely to undertake visits for household chores or for socializing but at the same time the gendered nature of occupations and employment also pose greater risk of infection among men[4].The typical COVID-19 symptoms occur most frequently in adults aged 30-60 years[8].The risk of death and severe illness with COVID-19 is best predicted by the age[7].

In the present study we found that positivity rate was high among males 61.3% and females contributed 38.7% of the burden which is similar to study done by William joe et al , male accounting to 65.7% and females 34.3%.

In this study female predominant cases were seen in age group of 16-30 years where as males in age group of 31-45 years, in concordance with study done by Mahboob Khazir et al[9], the number of confirmed cases were more (n=400) in age group of 20-40 years. The number of infected people is least (n=150, 5.9%) in the age group of 0-19 years[10]Experts said higher COVID-19 infection in young India is directly linked to their ratio of population[11]. Study by Yang Liu reported that the COVID-19 patients over 60 years had a higher rate of respiratory failure and needed a prolonged treatment than those at age below 60 years, demonstrating that elderly COVID-19 patients were much more severe and showed poorer response to treatment than the younger[12]

The clinical characteristics, disease progression and outcome in children and young adults appear significantly milder compared to older individuals. Children account for 1-5% of diagnosed COVID-19 cases. The possible reasons for lower number and milder infections in children and young adults include lower exposure to virions, being isolated at home and minimal exposure to pollution and cigarette smoke contributing to healthier respiratory tracts. Additionally, the distribution, maturation and functioning of viral receptors such as ACE2 may be important in age-dependent susceptibility to severe COVID-19[13]. In the present study children 0-15 years of age were the least affected group n=100 (6%) which is similar to study by Deepika B et al, 3.9%[14].

V. Conclusion

One of the most critical issues dealt by clinical and public health professionals during the pandemic is the spectrum of illness severity. The clinical features and prognosis of the disease vary among patients of different ages and a thorough assessment of age may help clinician worldwide to establish risk stratification for all COVID-19 patients.

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