Analysis of Co-infection of Plasmodium and SARS-Cov-2 and its impact on Healthcare services in India

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Abstract

The unprecedented outbreak of SARS-COVID-19 has brought a global health challenge for all countries. The clinical manifestations of SARS-Covid-19 are wide that includes fever, cough, diarrhoea, vomiting, headache, myalgia and fatigue. Many of these symptoms match with Malaria and it may be very difficult to distinguish COVID-19 from Malaria especially in the endemic areas. The risk of co-infection remains a concern owing to overburdening of healthcare services and possible scarcity of resources. In the present article, an analysis of confirmed COVID-19 and Malaria cases is carried out. The impact of co-infection on healthcare services is explored and also emphasis has been laid for the need of alert actions from frontline clinicians for appropriate diagnosis of potential co-infections in the COVID era.

Keyword- Malaria, Covid-19, Co-infection, Healthcare, Infection, Immunity

1. INTRODUCTION

Plasmodium is one of the most intriguing parasites responsible for causing morbid disease Malaria. The disease due to its varied spectrum is a crucial public health challenge and mostly affects the poor tropical and subtropical regions of world especially Africa, Asia, Europe, America. WHO took the initiative to eradicate malaria across the world between and reduced malaria transmission and even eliminated. More than 100 countries have eliminated malaria in the past years including Japan. However, India is still trying to work on its Malaria eradication programs. India carries 4% of the global malaria burden; 2% (275.5m) of India's population lived in high transmission (> 1 case per 1000 population) areas. India presents malaria infection through both *P. falciparum* (53% cases) and *P. vivax* (47%) of the infections.
With the ongoing struggle against malaria, the recent spread of the Coronavirus Disease 2019 (COVID-19), caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) has created a difficult situation. India reported over 2.2 million confirmed cases of the Coronavirus (COVID-19) as of August 10, 2020. Out of these, around 1.5 million patients have recovered, while 44.5 thousand cases were fatal. Table 1 shows the states where our research proposal intends to carry the epidemiological study for Malaria and Covid-19 infections.

Table 1: Covid-19 cases in States of India chosen to carry the proposed study (Data Source: Report from www.mygov.in)

S.No	State	Total Covid-19 Cases in state	Recovery	%Recovery	Death	%Death
1	Delhi	152580	137561	90.1	4196	2.7
2	Uttar Pradesh	154418	100432	65.0	2449	1.5
3	Maharashtra	595865	417123	70.0	20037	3.3
4	West Bengal	116498	86771	74.4	2428	2.0
5	Karnataka	226966	141491	62.3	3947	1.7

To study the correlation between COVID-19 and Malaria, a preliminary analysis was done by overlapping the Covid-19 cases as shown in table 1 with Malaria severity and species specific infection. The figure 1 shows that Malaria endemic regions have high rate of Covid-19 infection which is most severe in Mumbai and least severe in Kolkata in the dataset.

Many reports suggesting use of anti-malarial drug against COVID-19 infection have raised an important question about the unexplained correlation between Plasmodium parasites and SARS-CoV-2. WHO has also raised serious concerns over severity of Malaria situation during COVID-19 pandemic. Recently it was shown that around 10% increase in the BCG vaccination index is associated with a 10.4% reduction in COVID-19 mortality (Escobar et al, 2020). Also Hogan et al, 2020 showed that the HIV, TB and malaria related deaths over 5 years may be increased by up to 10%, 20% and 36%, respectively due to disruption in care services. However, there are hardly any studies trying to explore effect of Covid-19 infection on Malaria endemic regions in India.

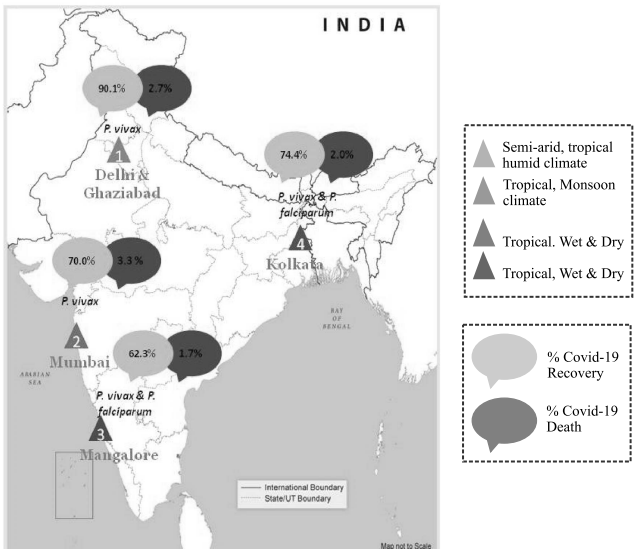

Figure 1: Map of India showing statistics of Malaria, climatic conditions and Covid-19 infection status as of August, 17, 2020 (Data Source: https://www.mygov.in/corona-data/covid19-statewise-status/)

The present study emphasize that while India struggles to meet the testing demand for COVID-19, the malaria test kits are widely available at community level. There is need for detailed study on the potential of COVID-19/malaria co-infections which can further guide clinicians on importance of testing for other causes of illness more so in this period when there is much emphasis to early detect COVID-19. With the easy availability of malaria tests, performing both malaria and Covid-19 tests in malaria endemic regions would help increase our understanding of parasite and virus relationship and thus designing better strategies in future to combat such morbid diseases.

2. CONCLUSION

The analysis highlights the importance of identifying possible co-infections along with SARS-CoV-2, which are many times ignored due to overlapping symptoms. Healthcare and physicians should be careful about the co-infection with other pathogens when COVID-19 is confirmed. There are growing areas in India which are endemic to Malaria and also exhibit high number of Covid-19 infections. More detailed analysis is required to find out the risk factors, clinical outcomes, and challenges for cases with COVID-19 and Malaria co-infections.

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