

Letters to the Editor

## Roles and challenges of primary care physicians facing a dual outbreak of COVID-19 and dengue in Singapore

Lawrence TM Lam<sup>\*,<sup>o</sup></sup>, Ying Xian Chua and David HY Tan<sup>o</sup>

National University Polyclinics, National University Health System, Pioneer Polyclinic, 1 Jurong East Street 21, Ng Teng Fong General Hospital Tower A Basement 2, 609606, Singapore

\*Correspondence to Lawrence TM Lam, National University Polyclinics, National University Health System, Pioneer Polyclinic, 1 Jurong East Street 21, Ng Teng Fong General Hospital Tower A Basement 2, 609606, Singapore; E-mail: [Lawrence\\_tm\\_lam@nuhs.edu.sg](mailto:Lawrence_tm_lam@nuhs.edu.sg)

Dear Sir/Madam,

Since the start of February 2020, Singapore has been battling a dual outbreak of COVID-19 and dengue with both conditions having similar presentations. Dengue is endemic in Singapore and as of 9 April 2020, there are 5091 confirmed cases of dengue and 98 active clusters (1). The number of COVID-19 cases in Singapore has risen exponentially, with 1910 confirmed cases currently (2). This poses a great challenge within primary care and provides a poignant reminder to primary care providers to keep up with epidemiological trends and rapidly evolving case definitions when confronting a novel pandemic.

We share our experience in managing this dual outbreak after two COVID-19 cases had false-positive dengue serology (3). This presented a diagnostic challenge with both conditions presenting with an acute febrile phase together with mild and undifferentiated symptoms.

We also briefly discuss the health-seeking behaviours of the first 162 locally transmitted cases in Singapore and the steps taken in Singapore to reduce community transmission. These include the re-activation of the Public Health Preparedness Clinics (PHPC) which provides government subsidized consultation and treatment for patients diagnosed with respiratory illnesses and hence, encouraging the public to seek medical attention early and to reduce doctor hopping.

### Managing a dual outbreak

The early stages of COVID-19 infections closely resemble that of dengue and other common respiratory viruses. Other vector-borne diseases such as Zika and Chikungunya also share similar presentations of fever, myalgia, leucopenia and thrombocytopenia and are usually difficult to distinguish clinically from dengue (4,5).

While these diseases share similar incubation periods with an acute febrile phase, respiratory symptoms of cough and dyspnoea should raise the clinical suspicion and prompt testing for COVID-19 (6–9).

As it is important to differentiate patients presenting with acute febrile illnesses early, we relied on earlier testing of dengue serology on day 3 of illness to rule out dengue infection. Singapore uses Standard Diagnostics (SD) BIOLINE kit which has an overall sensitivity of 93.9% [95% confidence interval (CI) 88.8–96.8%] and specificity of 92.0% (95% CI 81.2–96.9%) (10).

As point-of-care testing for COVID-19 was not available at our clinic, we referred patients with prolonged fever and a negative dengue serology for COVID-19 testing. As Singapore had only reported 10 Chikungunya cases and 1 Zika case during the same period with no active clusters reported, we did not test for both these viruses as the management would have been supportive (11).

### Challenges and discussion

We highlight the diagnostic challenge of COVID-19 in primary care, especially when facing a concurrent outbreak of an endemic local disease. The early stages of COVID-19 infections are virtually identical to other common viral infections, with many patients initially presenting with mild and undifferentiated symptoms (12). There is a role for early laboratory investigations and serological testing of local endemic conditions to narrow the list of differentials.

Significant thrombocytopenia is atypical for COVID-19 infections, observed in only 5–12% of clinical cases but is a prominent feature of dengue (6–9). Most patients with COVID-19 have mild respiratory symptoms though some develop dyspnoea at around 5–7 days from onset of symptoms (8,13).

Therefore, primary care physicians need to be abreast of current epidemiological trends, case definitions and recognize when there are variations in disease and symptomatology patterns. Within the climate of a novel infectious disease pandemic, we need to be aware of concomitant diseases and false-positive serology. Primary care providers should consider testing patients with persistent fever without a clear source for COVID-19 as earlier identification is key for containment.

Nine hundred and forty-two PHPCs were reactivated, increasing accessibility to primary care and encouraging the public to seek prompt medical attention, resulting in 71% of confirmed COVID-19 patients visiting a primary care doctor within 2 days of symptom onset where symptoms are mild and undifferentiated (2). Twenty-eight percent of these patients visited more than one primary care provider before getting diagnosed. Thirty-two percent of patients were identified at primary care, with the majority of cases referred during the first (37%) and second visit (31%) (2).

The average number of days between the initial primary care consult to admission and subsequent diagnosis was 5 days, in keeping with the clinical progression of COVID-19 (13). This could be shorter than other countries due to accessibility of health care and local health-seeking behaviours.

With ongoing widespread local transmission, travel history becomes less relevant and without any rapid point-of-care testing, we must rely on symptoms, contact history and maintain a high index of suspicion. We need to be cognizant of patients who have a prolonged duration of illness, especially fever (72%) and cough (83%) with multiple visits (12). If patients can be encouraged to keep to a single provider, either through financial reimbursement measures or assigning patients to a primary care provider, doctors will then be able to fully appreciate their symptom progression and have a better diagnostic yield.

The subsequent availability of COVID-19 swabs in our public primary care clinic has allowed our primary care doctors a 'swab and send home' strategy, alleviating the load off tertiary institutions by allowing symptomatic patients to rest at home in isolation while their swab results are pending. We are furthering the cause of the battle against COVID-19 by also validating new point-of-care test kits against the gold standard PCR swabs that we are currently carrying out.

## Conclusion

Currently, there is an unprecedented strain on health care systems worldwide. Primary care doctors will continue to play a key role in early identification and containment of this pandemic. We must obtain accurate contact and epidemiological history based on evolving local cluster transmissions and be alert to the possibility of false positives and multiple infections. Early testing for local endemic conditions should be considered. As most countries are now facing sustained community transmission, there is a need to shift towards rapid and reliable point-of-care testing for COVID-19 and endemic infections, and primary care facilities can help in validating new test kits that are rapidly being made available.

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## Declaration

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