# The importance of anamnesis in differential diagnosis: a case of SARS-CoV-2 and dengue virus co-infection

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## SUMMARY

Dengue fever should be included in the differential diagnosis of febrile illness even if another infection such as COVID-19 has been found in returning travellers from tropical and sub-tropical area where dengue virus circulates epidemically. We describe a 40-year-old man diagnosed with laboratory-confirmed COVID-19 and dengue fever during the COVID-19 outbreak in Milan, Italy.

*Keywords*: Dengue fever, COVID-19.

## INTRODUCTION

Dengue fever is an arthropod-borne disease widely distributed in tropical and sub-tropical regions with an estimate of 360 millions per year. In the last few years a rising number of imported cases of dengue has been reported in Europe linked to increasing human mobility. Dengue is recognized as the most common cause of fever in international travellers returning from South and Southeast Asia and Latin America [1].
The SARS-CoV-2 infection is pandemic and, as a consequence, returning travellers from tropical and sub-tropical area might present with COVID-19 complicated by an imported disease, as reported in this case [2].

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## CASE REPORT

A 40-year-old male native of Ecuador was admitted at our Infectious Disease Department with fever up to 39°C for at least four days, cutaneous itching maculopapular rash associated with abrupt anosmia and dysgeusia. A diagnosis of SARS-CoV-2 infection was done by positive nasopharyngeal swab. Blood tests showed normal leukocyte count and C-reactive protein, but thrombocytopenia (platelet count 98.000/mmc). His chest X-ray showed no pulmonary infiltration. The patient, during two medical interviews (in emergency room and at admission), reported adherence to quarantine measures in the previous months (left home only to buy food) with no contacts with known cases of COVID-19.
Fever and rash rapidly improved the day after hospital admission; however, a progressive worsening of laboratory blood tests was observed [white cell count 2,400/mmc (neutrophils 25%,

lymphocytes 70%), platelets 47.000/mmc, with increase in liver enzymes (aspartate transaminase 259 IU/L and alanine transaminase 145 IU/L)]. The atypical clinical course compared to the natural history of SARS-CoV-2 infection prompted us to perform a third detailed patient interview searching for the presence of missing anamnestic information. Surprisingly, at this time the patient referred to have spent abroad in Ecuador his quarantine and to have returned to Italy by air only two days before the hospital admission. The aviation health service was notified of SARS-CoV2 diagnosis in order to contact the passengers on the two flights (intercontinental and European) made by the patient. Moreover, in the suspect of a possible arboviral infection, serological and molecular test for flavivirus were promptly requested: specific immunoglobulin M (IgM) antibodies and real time Polymerase Chain Reaction (PCR) in urine for dengue turned positive. In the next days, the patient had progressive laboratory improvement, without complications, and was discharged after two consecutive negative tests for SARS-CoV-2.

## DISCUSSION

We believe that our case highlights some important points that warrant discussion. Firstly, the presence of exceptional situations such as the SARS-CoV-2 pandemic must not make us forget to always think of alternative diagnostic hypotheses. In particular, dengue fever has been proposed as the infection that could partially overlap with clinical and laboratory features of COVID-19 [3]. Moreover, some reports have described COVID-19 cases that were initially misdiagnosed as dengue infection; on the other hand, dengue fever and COVID-19 might be a hazardous combination and physicians should have raised awareness of this, especially in returning travellers from tropical and sub-tropical area where dengue virus circulates epidemically [3-11]. Secondly, we must always consider the hypothesis that the patients may be reluctant to tell the truth under stressful conditions (i.e. hospital admission, potential problems with immigration, etc.). The collection of all information is crucial for a correct diagnosis, also in presence of symptoms suggestive of a more probable disease (i.e. COVID-19 in the Northern Italy). Thirdly, thermal scanning is not an efficient measure for detecting incoming travelers with infectious diseases [12]. In fact, failure to detect fever as prognostic marker may be related to:

a) inadequate period of assessment (i.e. asymptomatic incubation phase);
b) non-specific symptomatology (several infectious and non-infectious diseases are associated with fever);
c) patients may fraudulently use paracetamol to escape the thermal scan checkpoints (i.e. at work, in the airports, etc.) to avoid quarantine or further time-consuming diagnostic investigations.

In conclusion, the SARS-CoV-2 pandemic is giving us the chance to turn this inauspicious event into a unique opportunity to let come out the submerged of coinfections (i.e. HIV, latent tuberculosis). However, this goal will be achievable only if SARS-CoV-2 pandemic does not alter our differential diagnostic awareness and if all the healthcare providers will increase the threshold of attention.

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None declared

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## REFERENCES

[1] Pagani G, Zanchetta N, Galimberti L, et al. Imported dengue fever: a 16-years retrospective analysis in Milan (Italy) and a brief review of the European literature. *Infez Med*. 2020; 28 (2), 243-52.
[2] WHO coronavirus disease (COVID-19) dashboard. Geneva: World Health Organization, 2020. Available online: https://covid19.who.int/ (last cited: 16 January 2021).
[3] Carosella LM, Pryluka D, Maranzana A, et al. Characteristics of patients co-infected with severe acute respiratory syndrome Coronavirus 2 and dengue virus, Buenos Aires, Argentina, March-June 2020. *Emerg Infect Dis*. 2021; 27 (2), 348-51.
[4] Yan G, Lee CK, Lam LTM, et al. Covert COVID-19 and false-positive dengue serology in Singapore. *Lancet Infect Dis*. 2020; 20 (5), 536.
[5] Masyeni S, Santoso MS, Widyaningsih PD, et al. Serological cross-reaction and coinfection of dengue and COVID-19 in Asia: Experience from Indonesia. *Int J Infect Dis*. 2021; 102, 152-4.
[6] Malibari AA, Al-Husayni F, Jabri A, Al-Amri A, Al-

harbi M. A Patient with dengue fever and COVID-19: coinfection or not? *Cureus.* 2020; 12 (12), e11955.
[7] Stringari LL, de Souza MN, de Medeiros Junior NF, et al. Covert cases of Severe Acute Respiratory Syndrome Coronavirus 2: An obscure but present danger in regions endemic for Dengue and Chikungunya viruses. *PLoS One.* 2021; 16 (1), e0244937.
[8] Nasomsong W, Luvira V, Phiboonbanakit D. Case Report: Dengue and COVID-19 Coinfection in Thailand. *Am J Trop Med Hyg.* 2020; doi: 10.4269/ajtmh.20-1340.
[9] Teotônio IMSN, de Carvalho JL, Castro LC, et al. Clinical and biochemical parameters of COVID-19 patients with prior or active dengue fever. *Acta Trop.* 2020; 214, 105782.
[10] Epelboin L, Blondé R, Nacher M, Combe P, Collet L. COVID-19 and dengue co-infection in a returning traveller. *J Travel Med.* 2020; 27 (6), taaa114.
[11] Radisic MV, Piro MA, Mori I, Rotryng F, Santamarina JF. SARS-CoV-2 and dengue virus co-infection. A case report. *Infez Med.* 2020; 28 (3), 416-9.
[12] Quilty BJ, Clifford S, Flasche S, Eggo RM, CMMID nCoV working group. Effectiveness of airport screening at detecting travellers infected with novel coronavirus (2019-nCoV) *Euro Surveill*. 2020; 25, 2000080.