

# HSV infections during the COVID-19 pandemic

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Sir,

The novel coronavirus SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) producing aggressive interstitial pneumonia has rapidly spread from its origin of emergence in Wuhan, China, to numerous countries worldwide [1]. Globally, infections are still increasing in number (3,318,442 as of 11:00 on May 1, 2020), similarly to the situation in Poland (12,877 cases) and in Germany (163,009 cases).

Some departments, clinics, and even entire hospitals have been transformed into infectious and observational-infectious departments. Our dermatology department was transformed into an observational-infectious department.

Among the measures intended to promote social distancing, many schools have been closed and classes shifted to home-based distance-learning models. The first school closures began in mid-March, 2020, and some voivodeships have already closed schools for the rest of the academic year.

Data coming from recent Chinese and Italian studies demonstrate that children usually present mild to moderate COVID-19 symptoms, with a large proportion being asymptomatic. In particular, children present significantly milder symptoms of fever, cough, and pneumonia compared to adults. For this reason, children are regarded as silent carriers [2].

The course of SARS-CoV-2-induced COVID-19 is modulated by preexisting cardiovascular and metabolic disorders, which predispose to a more severe course and dangerous health issues such as obesity and metabolic associated fatty liver disease (MAFLD) [3,4].

Although the most common symptoms of COVID-19 are respiratory, there is growing evidence that tissue damage in COVID-19 is not limited to pulmonary epithelia alone [4-6].

Several Polish children, unrelated but at the center of an epidemic, were recently hospitalized with meningitic symptoms preceded by epilepsy. In addition, children with severe infectious mononucleosis were also hospitalized. All of the children were between 1 and 11 years old. COVID-19 tests were negative, and laboratory findings argued for an association with a herpes virus infection.

There is growing evidence coming from China and Japan for a possible central nervous system invasion by COVID-19, including meningitis and convulsion accompanied by unconsciousness [7,8]. In one of these cases, the RNA specific to SARS-CoV-2 was not detected in a nasopharyngeal swab, but in the cerebrospinal fluid. Anti-HSV-1 and varicella-zoster virus IgM antibodies were not detected in serum samples.

Known viruses that cause meningitis include enteroviruses, herpes simplex virus (HSV-1, but mainly HSV-2), varicella-zoster virus, mumps virus, HIV, lymphocytic choriomeningitis virus, arboviruses, and influenza viruses. HSV-2 is the leading cause of viral meningitis and the most commonly recognized infectious cause of benign, recurrent meningitis [9]. HSV infection is known to promote a thrombogenic environment by altering the properties of endothelial cell surfaces through various mechanisms [10].

It has recently been demonstrated that critical systemic coagulopathy in COVID-19 patients is related to

**How to cite this article:** Brzezinski P, Wollina U. HSV infections during the COVID-19 pandemic. *Our Dermatol Online*. 2020;11(Supp. 2):19-20.

**Submission:** 19.06.2020; **Acceptance:** 12.08.2020

**DOI:** 10.7241/ourd.2020S2.7

deposits of terminal complement components C5b-9 (membrane attack complex), C4d, and mannose-binding lectin (MBL)-associated serine protease (MASP)-2 in the microvasculature of the lungs and skin. COVID-19 spike glycoproteins were found to be colocalized in the microvasculature with C4d and C5b-9 [11].

In the case of central nervous system symptoms and a suspicion of COVID-19, we recommend the investigation of not only nasopharyngeal swabs, but the cerebrovascular fluid as well.

## Consent

The examination of the patient was conducted according to the Declaration of Helsinki principles.

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Source of Support:** Nil, **Conflict of Interest:** None declared.