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MEETING ABSTRACTS

TOXIC PRODUCTS OF SARS-CoV-2 AND OTHER NON-TOXIC MARKERS IN COVID-19 PATIENTS

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Coronavirus disease COVID-19 is highly infectious disease caused by SARS-CoV-2 virus as a novel coronavirus led to pandemic. Due to fast transmission COVID-19 has become a global problem. The virus is spread by aerosol from infected people and persists in the air for a long period. SARS-CoV-2 affects the lungs, but it can also affect digestiv or cardiovascular systems, can attact the brain, damage vessels and can lead to neurological manifestation. COVID-19 has several clinical symptoms and can lead to multiorgan dysfunction and death. On the other hand, in some infected persons COVID-19 can take place asymptomatic. Due to the risk of rapid spread of COVID-19, the early prediction of the onset of the epidemic is important. The Water Based Epidemiology (WBE) is an effective tool for monitoring the number of infections and can serve as a tool to monitoring various human activity including health status of population in given area. One of the advantage of WBE in last pandemic is their capability to reveal the outbreaks at an early stage, including presymptomatic or asymptomatic transmission of SARS-CoV-2. The use of WBE is based on the principle of viral shedding in stool samples and on the detection of SARS-CoV-2 viral mRNA by PCR method in wastewater samples. On the other hand, some non-specific markers from COVID-19 infected persons can also be used in WBE. Viral infections are associated with inflammation. Neopterin, a pteridine derivative, is produced in the metabolism after some stimulus. Neopterin was found in urine and other body fluids, as blood serum, cerebral spinal fluid in COVID-19 infected persons in high levels. Through urinary excretion, neopterin was detected in wastewater samples. The other markers, as toxin-like peptides, similar or identical to toxic components of venoms from animals, such as conotoxins, phospholipases, phosphodiesterases, zinc metal proteinases, and bradykinins, were identified in blood plasma, urine and faecal samples from COVID-19 patients. These markers, including neopterin, can be potencially useful in WBE as markers of rapid prediction of the onset of the epidemic. The early detection of the presence of SARS-CoV-2 within communities can also give healthcare authorities time to prepare for potential outbreaks and time to prepare measures to protect population. **Acknowledgment:** This study was supported by the project VI04000017 „Use of wastewater monitoring as an early warning tool against the emergence of an epidemiological situation" Security Research 4.VS BV III of the Ministry of Interior of the Czech Republic.

Keywords: SARS-CoV-2; Wastewater Base Epidemiology (WBE); biomarkers; rapid warning

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