

What lies ahead after the coronavirus?

COVID-19, we are talking about nothing else!

As the number of confirmed cases of COVID-19 surges past 2.2 million globally and deaths surpass 150000, clinicians and pathologists are struggling to understand the damage wrought by the coronavirus as it tears through the body. They are realizing that although the lungs are ground zero, its reach can extend to many organs including the heart and blood vessels, kidneys, gut, and brain [Wadman et al. 2020].

The virus tears through the body

Its reach can extend to many organs. This is a very disconcerting message [Ledford 2020; Wadman et al. 2020].

The novel coronavirus can enter the nose and throat. It finds a home in cells that are rich in a cell-surface receptor called angiotensin-converting enzyme 2 (ACE2). Throughout the body, the presence of ACE2, which normally helps regulate blood pressure, marks tissues that are vulnerable to infection, because the virus requires that receptor to enter a cell. Once inside, the virus hijacks the cell machinery, making copies of itself and invading new cells.

If the immune system fails to beat back the virus during the initial phase, it may reach the windpipe and attack the lungs. The lungs make sure the oxygen is carried to the rest of the body, but as the immune system is busy waging war against the invader, this healthy oxygen transfer is disrupted. Front-line white blood cells release inflammatory molecules called chemokines, a family of small cytokines, which in turn summon more immune cells that target and kill virus-infected cells, leaving behind a mash of fluid and dead cells – pus. This is the underlying pathology of pneumonia, with its corresponding symptoms of cough, fever, and rapid and shallow respiration. Some COVID-19 patients recover with no more support than oxygen breathed in through nasal prongs, while others deteriorate, often quite suddenly.

A number of infected patients develop heart-related problems either for no apparent reason or as a complication of a pre-existing cardiac disease. A report dating back to the early days of the pandemic describes the extent of cardiac injury among patients hospitalised with COVID-19 in Wuhan [Huang et al. 2020]. Moreover, according to a retrospective study by Shi et al. [2020] many hospitalised patients in Wuhan suffered from kidney failure. Those with acute kidney injury were more than 5 times as likely to die as COVID-19 patients without the condition. Another striking set of symptoms in COVID-19 patients concerns the brain and central nervous system (CNS). While neurological manifestations of COVID-19 have not yet been studied appropriately, it is highly likely that some of these patients, particularly those who suffer from a severe illness, have CNS involvement and neurological manifestations [Asadi-Pooya & Simani 2020]. A growing body of evidence also suggests that the new coronavirus, as is the case with its cousin SARS, can infect the lining of the lower digestive tract, where the crucial ACE2 receptors are abundant [Ng & Tilg 2020]. But the intestines is not where the march of the disease through the body ends. For example, up to one-third of hospitalised patients develop

conjunctivitis – pink, watery eyes – although it is not clear whether the virus directly invades the eye. And other reports suggest liver damage. More than half COVID-19 patients hospitalised in two Chinese centres had elevated levels of enzymes indicating injury to the liver or bile ducts [Wadman et al. 2020].



Do face masks really reduce coronavirus spread?

Several experts suggest that it might not be the virus alone that rages through the body and kills. It may well be the case that an overactive immune response also contributes. Some critically ill patients with COVID-19 had high blood levels of cytokines, which can trigger a disastrous overreaction of the immune system known as “cytokine storm”. Cytokines are chemical signaling molecules that guide a healthy immune response. In a cytokine storm, however, levels of certain cytokines soar far beyond what is needed and immune cells start to attack healthy tissues. Blood vessels leak, blood pressure drops, clots form, and catastrophic organ failure can ensue.

Many people living in the Western world suffer from one more chronic diseases

These chronic diseases – obesity, diabetes, respiratory diseases, liver, kidney and cardio-vascular diseases, auto-immune diseases, and many others – involve disruption of the normal immune function, resulting in inflammation. Chronic inflammation primes the body to react with a heightened response to immune system insults such as COVID-19 infections. A terrifying observation, all the more since these chronic diseases have been steadily increasing over the past 50 years in association with the dramatic increase in chemical production for use in plastics, construction materials, pesticides, personal care products, furniture, cookware, food packaging, textiles, and many other products that are steadily infiltrating every aspect of human life.

Many of these chemicals are categorised as endocrine disrupting chemicals (EDC) that can interfere with the normal functioning of hormones involved in cell communication, including regulating immune responses and inflammation. We are exposed to such chemicals through a myriad of

consumer products, e.g. our drinking water and highly processed food. However, the dangers posed by continuous exposure to EDC [Yang et al. 2006] are insufficiently acknowledged.

vom Saal & Cohen [2020] conclude, in their Environmental Health News communication, that the combination of EDC and insufficient amounts of antioxidants and micronutrients create the perfect setting for an abnormal inflammatory response. Moreover, several of the nutrients (e.g. zinc, vitamin B3, vitamin C, vitamin D) and antioxidants from fruits and vegetables are among the many therapeutic interventions currently being looked at to reduce the length and severity of coronavirus infections.

COVID-19 confirms my worst fears!

As it happens, I have already repeatedly expressed my concern about the ubiquitous nature of chemical contamination and the consequences of our exposure to it. And to make matters worse, we are not properly prepared to tackle the chemical contamination problem [Goeyens 2020].

Belgian politicians recently told newspaper journalists that scientists were being given too much room to maneuver. I believe – and I may not be the only one – that science and a genuine desire to protect public health will be more than necessary in the post-corona era. With steadily increasing chronic diseases, it is hardly possible not to establish a link between chemical contaminants and disease. We have to redress this global disaster situation and defuse the ticking time bomb that has been inserted into our bodies without our consent. We must immediately stop polluting our planet. Let us make that our first priority!

We were not intended by providence to rule the world. The biosphere does not belong to us; we belong to it [Wilson 2016].

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