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High Sodium Intake – A Cause of Low COVID-19 Severity Among Mongolians?

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SARS-CoV-2 virus

The novel coronavirus (SARS-CoV-2), which causes a disease known as Coronavirus Disease-2019 (COVID-19), has rapidly spread to many countries since December 2019. On March 11, 2020, the WHO declared the COVID-19 outbreak a global pandemic [1-2]. Worldwide, as of July 4, 2020, there have been 10,922,324 confirmed cases of COVID-19, including 523,011 deaths, reported to WHO [3]. Few countries have contained the outbreak. Mongolia has among the world's best responses, preventing the explosion in its population of 3.3 million. In Mongolia, all the confirmed cases have been imported. Out of the registered 220 cases, 185 have recovered and discharged from the National Center for the Communicable Diseases. In only a few instances were the cases severe, according to the Mongolia Ministry of Health's report of July 4, 2020. No deaths or local cases of human-to-human transmission have been reported in the country to date [4].

Conversely, the severity and mortality rates are higher in many countries [3]. Therefore, recent studies have focused on investigating the factors related to the variation in the severity of COVID-19 [5-8]. Among reported factors that might play a role in the pathogenesis and severity of COVID-19, there is a notable theory regarding daily salt consumption [7-8].

Post et al. first hypothesized that low sodium intake could be a risk factor for severe and fatal COVID-19 infection. They postulated that high dietary sodium might downregulate the expression of angiotensin-converting enzyme 2 (ACE-2) receptor, by which SARS-CoV is known to infect host cells [9]. Their hypothesis was based on an observational study of mortality of COVID-19 that estimated mortality rates from COVID-19 infection in China are nearly 3-times lower than in other countries [10]. The daily consumption of sodium might explain the difference. In the WHO report, China has the highest daily intake of sodium compared to other countries in the world: 10.9 grams per day as of 2019, while it was estimated to about 9 grams per day in the United States salt consumption [11]. In 2019, the daily salt intake equivalent was 10.5 grams per day in adult Mongolians [12].

The hypothesis abovementioned has been substantiated in other studies. Fletcher et al. (n=2756) found that increased sodium levels were inversely associated with both hospital admission and severity of COVID-19 [7]. Burden et al. studied a total of 4,670,832 cases and 311,384 deaths due to SARS-CoV-2 by 181 countries by May 18, 2020, to investigate whether

the modifiable risk factors affect SARS-CoV-2 infection and mortality. Their study found that high salt intake was associated with lower COVID-19 mortality [8]. Furthermore, a review by Post et al. recommended that sodium intake should be monitored carefully during severe COVID-19 infections, especially in patients on low sodium diets before infection. They recommended that treatment should start with stopping the sodium restriction and fluid resuscitation despite a potential conflict regarding common dietary recommendations [13]. Further studies also suggested that ACE2 receptor expression through increased salt intake could also have anti-inflammatory effects that could protect against complications of COVID-19, such as acid aspiration-induced acute respiratory distress syndrome [14-15].

Finally, although a higher sodium consumption is a bad dietary habit and a risk factor for cardiovascular diseases, physicians should be careful recommending restricted dietary sodium intake to people with hypertension and kidney diseases infected with SARS‑CoV‑2.

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