Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letters to the Editor

A proposal for appropriate countermeasures to infectious diseases in schools

To the Editor:

Recently, I came across the 2012 report, "US school/academic institution disaster and pandemic preparedness and seasonal influenza vaccination among school nurses," by Rebmann et al.[1] The report pointed out that although school preparedness for disasters and infectious disease emergencies is important, many schools are lacking adequate plans. It also highlighted the need for schools in the United States to coordinate their plans for infectious disease emergencies with local and regional disaster response agencies, and to test these through disaster drills and exercises. In the case of South Korea, after the outbreak of Middle East respiratory syndrome in 2015, communication between schools and the related prevention institutes and construction of collaborative systems were identified as areas in need of improvement. In this context, we conducted a survey among 311 school members who had participated in simulation training for countermeasures against infectious diseases in schools. The results demonstrated role allocation between members to be the area of highest concern. Coordination with disaster response agencies is important; however, attention must also be given to the internal allocation of roles among school members, such as the principal, school nurse, classroom teachers, and administrative staff.

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A proposal for the eradication of Middle East respiratory syndrome

To the Editor:

Recently, we came across the recent report, "Outcome of strict implementation of infection prevention control measures during an outbreak of Middle East respiratory syndrome," by El Bushra et al,[1] and the related letter by Yasri and Wiwanitkit.[2] Middle East respiratory syndrome (MERS) is known to be a zoonosis from camels to humans.[3,4] In this letter, we present the idea about the possibilities of eradicating MERS through the experience of brucellosis control in South Korea. In South Korea, since 2005, the Korea Center for Disease Control and Prevention has conducted a survey annually on targeted high-risk groups for brucellosis, such as livestock farmers. Through these surveys, the seroprevalence of brucellosis among the high-risk groups has been reduced to zero steadily in 10 years. With these activities, in the animal sector, premarketing and annual tests have been implemented for all cattle >1 year of age since 2004 and 2007, respectively. Through these efforts, the incidence of both bovine and human brucellosis has decreased since 2006.[5,6] Unfortunately, these control activities for camels are supposed to be insufficient in the Middle East region. Both cows and camels are linked to humans in terms of providing labor and food. For this reason, when these animals are infected, humans are easily exposed to the diseases, and both animals may not be easily culled. In particular, Koreans usually enjoy eating raw beef (*Yukhoe*). Similarly, Middle Easterners enjoy drinking raw camel milk. The test and slaughter with compensation policy has been very effective to control brucellosis in both humans and cattle in Korea. Of course, we do not think that the test and slaughter policy is the ultimate solution. However, development of a vaccine is now at a standstill, and currently, >1,500 patients are infected worldwide, with a mortality rate of 40%. MERS itself causes fear among us. We wonder why the aforementioned policies have not been formulated in the Middle East region. The successful control of brucellosis in South Korea was achieved from cooperation between the veterinary and medical sectors. For the control of MERS, more extensive activities in the Middle East region must be implemented. In particular, avoidance of eating unpasteurized dairy products and culling of infected camels, along with surveillance and a compensation policy, will help to eradicate MERS in the region.

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Destruction of *Clostridium difficile* spores colitis using acidic electrolyzed water

To the Editor:

Acidic electrolyzed water (AEW) is a product of an inexpensive electrolysis process. It can be easily synthesized using a simple and relatively inexpensive technology. The use of AEW as a disinfectant has been previously described in the literature, most often in the context of food disinfection, including fruit, vegetables, and eggs. It reduces the morbidity rate caused by bacteria that can be transmitted through these food products, such as *Salmonella* spp, *Listeria monocytogenes*, *Yersinia* spp, and *Escherichia coli*.[1,2] In addition to disinfection of food products, it has also been reported that AEW can disinfect medical equipment, such as endoscopes and hemodialysis systems.[3]

The antimicrobial mechanism of AEW is still not fully understood. Some researchers believe that the antimicrobial activity can be attributed to the high oxidation reduction potential (ORP) of AEW. High ORP causes a change in bacterial metabolism and adenosine triphosphate production, probably because of changes in the electron current flow into bacterial cells. Low pH also destabilizes the bacterial outer membrane, resulting in entry of hypochlorous acid into bacteria. Hypochlorous acid, which is very active and contains chlorine compounds, kills bacteria by inhibiting glucose oxidation by certain enzymes that are important in carbohydrate metabolism.[2,4]

The bacterium *Clostridium difficile* has become a major epidemiologic challenge in recent years. One of the most difficult problems concerning this bacterium is that we do not have an efficient disinfectant for eradication of the bacterial spores found in patients' feces that constitute a source of transferring the infection to other patients.[5] In this study we examined the disinfection efficiency of AEW pH 5 against spores of *C difficile*. Bacteria were isolated from patients diagnosed as suffering from *C difficile* infection. Thirty suspensions of *C difficile* spores were prepared at a concentration of 10^6 spores per milliliter; these spores were grown in AEW prepared with the aid of the Super Oxide Water Ionizer Batch System (BionTech, Gyeonggi-do, Korea). We also compared the disinfection efficiency of AEW and Septadine (chlorhexidine gluconate 0.5 wt/vol and alcohol 70%), which is the customary disinfectant for hands and surfaces.

The survival of spores was monitored every 15 minutes for an hour, using semi-quantitative culture containing CHROMagar *C. difficile* (bioMérieux, Durham, NC) under anaerobic conditions. Under exposure to AEW, there was a gradual decline after 30 minutes in the quantity of surviving spores, and at the end of the trial there were 10^3 spores per milliliter. Exposure to Septadine led to a sharp drop in the percentage of living spores after 15 minutes, and within 60 minutes there was complete destruction of all spores. From these results we can conclude that the potential of AEW to destruct *C difficile* spores exists, but the water quality has to be improved, by means of lowering the pH or changing the ORP concentration. AEW's advantage is that it does not cause damage to the environment or to expensive medical infrastructure. In addition, when in contact with water or with any other organic solution, it is neutralized and loses its activity.

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