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REVIEW

Challenges presented by MERS corona virus, and SARS corona virus to global health

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Abstract Numerous viral infections have arisen and affected global healthcare facilities. Millions of people are at severe risk of acquiring several evolving viral infections through several factors. In the present article we have described about risk factors, chance of infection, and prevention methods of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV), human coronaviruses (CoVs) frequently cause a normal cold which is mild and self-restricting. Zoonotic transmission of CoVs such as the newly discovered MERS-CoV and SARS-CoV, may be associated with severe lower respiratory tract infection. The present review provides the recent clinical and pathological information on MERS and SARS. The task is to transform these discoveries about MERS and SARS pathogenesis and to develop intervention methods that will eventually allow the effective control of these recently arising severe viral infections. Global health sector has learnt many lessons through the recent outbreak of MERS and SARS, but the need for identifying new antiviral treatment was not learned. In the present article we have reviewed the literature on the several facets like transmission, precautions and effectiveness of treatments used in patients with MERS-CoV and SARS infections.

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1. Background

In recent times, several life threatening viruses have emerged. They have been responsible for causing significant human mortality, in addition to raising serious public health concerns worldwide. Due to modern life, extensive travel of humans and goods, their outbreak anywhere in the world could potentially be a risk everywhere. Two novel viruses were implicated to be responsible for severe acute illness in recent times, i.e. Middle East Respiratory Syndrome-Corona-Virus (MERS-CoV) and severe acute respiratory syndrome-corona-virus (SARS-CoV) (To et al., 2013; Meyer et al., 2015). These two viruses are causing acute and often fatal illness. Due to their high fatality rate (30–90%), they have had dual effect: fear among public from contracting one or more of them as well as high burden on the healthcare system, including the treating physician and other health care workers. The reservoir of the viruses is usually animal, including: bats, camels, or chimpanzees. Apart from animal to human transmission, human to human transmission has been reported, usually from an infected patient to a member of the health care team and to other patients in the hospital. Although no specific treatment has been recommended for their management so far; supportive treatment has shown to improve the outcome. Antiviral vaccines are under process. These novel viruses represent significant challenges to public health in general and to public health services and infection control in specific. Intensive education awareness and multi directional care does improve disease outcome. Therefore an accurate knowledge of their reservoir, their transmission, presenting symptoms approach to their investigation and best possible management together with preventive steps, is necessary. Close surveillance and vigilance remains a top priority to physicians and health authorities alike. In the present article we have reviewed the literature on several aspects like transmission, safety and efficacy of therapies used in patients with MERS-CoV and SARS infections.

2. MERS corona virus

As of January, 2016 WHO has reported 1638 human cases, including 587 deaths due to Middle East Respiratory Syndrome (MERS co-V) (WHO, 2014; Gostin and Lucey, 2015). According to WHO, MERS a deadly disease caused by corona virus, "is a threat to entire world" (Zaki et al., 2012; Bialek et al., 2014; Azhar et al., 2014; Pereyaslov et al., 2013). MERS-CoV is considered a deadly virus with a single strand RNA (de Groot et al., 2013; Chu et al., 2014).

The MERS-CoV has been identified in various countries in the gulf region, Korea and European region with an obviously high death rate. It is taxonomically similar to the SARS-CoV and has also been linked with serious respiratory disease along with nosocomial transmission in hospital areas. The first human case was reported in 2012 from Saudi Arabia. Later it was isolated from Egypt from a patient's lung. Apart from Saudi Arabia, nearly 22 countries including UAE, Kuwait, Qatar, Indonesia, Thailand, UK, Korea, China and USA were reported to have MERS cases (Azhar et al., 2014; Pereyaslov et al., 2013). In USA the first case of MERS-CoV was identified on 2nd May, 2014, in a traveler who came from the Kingdom of Saudi Arabia. The second instance of MERS-CoV was recorded on 11th May, 2014, which was confirmed in a traveler who is also from the Kingdom of Saudi Arabia. The Republic of Korea's first, or "index", case was confirmed on 20 May 2015 and notified to WHO the same day, till today 185 cases are reported in Korea including 36 deaths.

A team of WHO and King Saud University (KSU) experts, in joint collaboration, isolated MERS virus from nasal swabs of camels and demonstrated that the whole genome sequence of human and camel obtained virus is indistinguishable (Briese et al., 2014). Although person-to-person transmission is low, it does occur from patients to health care workers and close contacts. So far, there is no specific vaccine or treatment for the disease. Maintaining hygiene, avoiding contact with camel or infected patients is mandatory to prevent further spread of MERS.