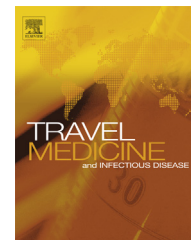



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevierhealth.com/journals/tmid


EDITORIAL

Middle East Respiratory Syndrome (MERS) coronavirus. What travel health advice should be given to Hajj pilgrims?

In this issue of *Travel Medicine and Infectious Disease*, Hon urges health authorities to provide consistent terminology for respiratory syndromes and illustrates the importance of travel in the dissemination of such disease [1]. The latest respiratory syndrome to cause waves in the infectious disease world is the Middle East Respiratory Syndrome (MERS). This is a new human disease that was first reported from Saudi Arabia after identification of a novel coronavirus (CoV) from a Saudi Arabian patient who died from severe respiratory illness in June, 2012 [2].

As of August, 28 2013, 102 laboratory-confirmed cases of MERS have been reported worldwide to WHO, including 49 deaths (http://www.who.int/csr/don/2013_08_28/en/index.html).

A clinical synopsis of 47 cases of MERS-CoV infection identified between September, 2012, and June, 2013, in Saudi Arabia was recently published [3]. Of note, is the high rate of underlying co-morbidity (96%) in patients with MERS, including diabetes (68%), hypertension (34%), chronic cardiac disease (28%), and chronic renal disease (49%) [3]. Hospital outbreaks have been described, notably in Saudi Arabia and Jordan with health care-associated human-to-human transmission [4,5]. Family clusters have been also described notably in Saudi Arabia [6]. Travel associated cases have been observed in Europe, notably in UK, France, Germany and Italy with secondary cases in close contacts of index cases without a travel history suggesting person-to-person transmission [7–10].

MERS is therefore to be added to the numerous diseases that travel medicine expert have to deal with in terms of prevention, surveillance and clinical management.

Since the first cases were reported in April 2012 from Jordan, most cases were reported from Saudi Arabia where the Hajj, the largest religious mass gathering takes place annually. The Hajj is expected to draw over three million pilgrims from within Saudi Arabia and around the world.

Given the predicted population movements out of Saudi Arabia, there may be a potential for worldwide spread of MERS-CoV according to Kahn and colleagues [11]. By contrast, Breban and colleagues calculated that the risk for MERS-CoV to have pandemic potential does not yet exceed 5%, but they did not factor in the effect of the Hajj mass gathering in their scenario [12].

During the Hajj 2012, a cohort survey was conducted among French pilgrims with the purpose of investigating nasal virus carriage acquisition [13,14]. No case of MERS-CoV nasal carriage was evidenced in this cohort, despite high rates of respiratory symptoms [13]. However, a rapid acquisition of other respiratory viruses was evidenced among pilgrims during their stay in the KSA, most notably rhinovirus, which highlights the potential of spreading these infections in the pilgrims' home countries upon their return [14].

The Saudi Ministry of Health recommends that elderly (above 65 years of age) and those with chronic diseases (e.g. heart disease, kidney disease, respiratory disease and diabetes) and pilgrims with immune deficiency (congenital and acquired), malignancy and terminal illnesses, pregnant women and children (under 12) coming for Hajj and Umrah this year, postpone the performance of the Hajj and Umrah for their own safety (<http://www.moh.gov.sa/en/HealthAwareness/Hajj/Pages/005.aspx>). The US CDC encourages pilgrims traveling to Saudi Arabia to perform Hajj or Umrah to consider this advice (<http://wwwnc.cdc.gov/travel/notices/watch/hajj-umrah-2013>). By contrast, WHO and the European CDC do not recommend the application of any travel restriction in relation with MERS-CoV (<http://www.who.int/ith/updates/20130605/en/index.html>, <http://www.ecdc.europa.eu/en/publications/Publications/MERS-CoV-novel-coronavirus-risk-assessment.pdf>).

The Saudi Ministry of Health recommendation that the population groups at highest risk of the complications of MERS voluntarily refrain from the 2013 Hajj is very

challenging. A similar recommendation was part of the plan to mitigate the transmission of influenza A H1N1 at the 2009 Hajj pilgrimage to Mecca and resulted in poor adherence among French pilgrims departing from Marseille [15]. The resulting incidence of influenza like illness in these pilgrims reported during the Hajj was 2.3 higher than that of no-hajj attending controls from Marseille area [16].

Public health agencies are unanimous in recommending that pilgrims apply personal protective measures against respiratory infection (wearing face mask, cough etiquette, hand hygiene, use of disposable tissues, and avoiding contact with sick people). Such measures have already been shown to be highly accepted by pilgrims [17].

Though an animal reservoir is considered likely, none has been identified yet. The presence of MERS-CoV neutralizing antibodies in dromedary camels have been described in Oman and Canary Islands providing a clue as to a potential source for human infection [18]. French team in Marseille, recently investigated the attitude of pilgrims toward raw-Camel milk consumption, if offered during their stay in Saudi Arabia; 41% said that they would drink it if offered during the pilgrimage [19]. Given that camel milk consumption in the Middle East is associated with several zoonotic infections in man, it is recommended that Hajj pilgrims be cautioned against consuming unpasteurized dairy products. It is also advisable to avoid contact with live farm or wild animals since the MERS-CoV was recently isolated from the feces of a bat from Saudi Arabia [20].

Besides individual preventive measure implementation, travel health practitioners as part of global public health vigilance will be key elements in reinforcing the surveillance of imported cases which is already monitored by existing international Networks including GeoSentinel (<http://www.istm.org/geosentinel/main.html>), Euro-travNet (<http://www.istm.org/eurotravnet/main.html>) and TropNet (<http://www.tropnet.net/index.php?id=3>).

The emergence of severe acute respiratory syndrome (SARS) demonstrated the speed at which an infectious disease, in this globalized world, can move beyond its local origins to become a global crisis affecting the health of people and economies by reducing international travel and trade [21]. MERS is not SARS, and the ability of this virus to spread from person-to-person thus far appears limited [12], however, super-spreading events as observed during SARS could significantly alter the global course of this epidemic [11].

Conflict of interest

None.

References

- [1] Hon KL. Severe respiratory syndromes: travel story matters. *Travel Med Infect Dis* 2013 [in press].
- [2] Zaki AM, van Boheemen S, Bestebroer TM, Osterhaus AD, Fouchier RA. Isolation of a novel coronavirus from a man with pneumonia in Saudi Arabia. *N Engl J Med* 2012 Nov 8; 367(19):1814–20.
- [3] Assiri A, Al-Tawfiq JA, Al-Rabeeh AA, Al-Rabiah FA, Al-Hajjar S, Al-Barrak A, et al. Epidemiological, demographic, and clinical characteristics of 47 cases of Middle East respiratory syndrome coronavirus disease from Saudi Arabia: a descriptive study. *Lancet Infect Dis* 2013 Sep;13(9):752–61.
- [4] Assiri A, McGeer A, Perl TM, Price CS, Al Rabeeh AA, Cummings DA, et al. Hospital outbreak of Middle East respiratory syndrome coronavirus. *N Engl J Med* 2013 Aug 1;369(5). 407–16.
- [5] Hijawi B, Abdallat M, Sayaydeh A, Alqasrawi S, Haddadin A, Jaarour N, et al. Novel coronavirus infections in Jordan, April 2012: epidemiological findings from a retrospective investigation. *East Mediterr Health J* 2013;19(Suppl. 1):S12–8.
- [6] Memish ZA, Zumla AI, Al-Hakeem RF, Al-Rabeeh AA, Stephens GM. Family cluster of Middle East respiratory syndrome coronavirus infections. *N Engl J Med* 2013;368:2487–94.
- [7] Bermingham A, Chand MA, Brown CS, Aarons E, Tong C, Langrish C, et al. Severe respiratory illness caused by a novel coronavirus, in a patient transferred to the United Kingdom from the Middle East, September 2012. *Euro Surveill* 2012;17:20290.
- [8] Guery B, Poissy J, el Mansouf L, Séjourné C, Ettahar N, Lemaire X, et al., The MERS-CoV Study Group. Clinical features and viral diagnosis of two cases of infection with Middle East respiratory syndrome coronavirus: a report of nosocomial transmission. *Lancet* 2013;381:2265–72.
- [9] Drosten C, Seilmaier M, Corman VM, Hartmann W, Scheible G, Sack S, et al. Clinical features and virological analysis of a case of Middle East respiratory syndrome coronavirus infection. *Lancet Infect Dis* 2013 [published online June 17].
- [10] Puzelli S, Azzi A, Santini MG, Di Martino A, Facchini M, Castrucci M, et al. Investigation of an imported case of Middle East respiratory syndrome coronavirus (MERS-CoV) infection in Florence, Italy, May to June 2013. *Euro Surveill* 2013;18(34) [pii=20564].
- [11] Khan K, Sears J, Hu VW, Brownstein JS, Hay S, Kossowsky D, et al. Potential for the international spread of Middle East respiratory syndrome in association with mass gatherings in Saudi Arabia. *PLoS Curr* 2013 Jul 17;5.
- [12] Breban R, Riou J, Fontanet A. Interhuman transmissibility of Middle East respiratory syndrome coronavirus: estimation of pandemic risk. *Lancet* 2013 Jul 4 [pii: S0140-6736(13) 61492-0].
- [13] Gautret P, Charrel R, Belhouchat K, Drali T, Benkouiten S, Nougaiere A, et al. Lack of nasal carriage of novel coronavirus (HCoV-EMC) in French Hajj pilgrims returning from the Hajj 2012, despite a high rate of respiratory symptoms. *Clin Microbiol Infect* 2013 Jul;19(7):E315–7.
- [14] Benkouiten S, Charrel R, Belhouchat K, Drali T, Salez N, Nougaiere A, et al. Circulation of respiratory viruses among pilgrims during the 2012 Hajj Pilgrimage. *Clin Infect Dis* 2013 Jul 19 [Epub ahead of print].
- [15] Gautret P, Parola P, Brouqui P. Risk factors for H1N1 influenza complications in 2009 Hajj pilgrims. *Lancet* 2010 Jan 16; 375(9710):199–200.
- [16] Gautret P, Parola P, Brouqui P. Relative risk for influenza like illness in French Hajj pilgrims compared to non-Hajj attending controls during the 2009 influenza pandemic. *Travel Med Infect Dis* 2013 Mar–Apr;11(2):95–7.
- [17] Gautret P, Soula G, Parola P, Brouqui P. Hajj pilgrims' knowledge about acute respiratory infections. *Emerg Infect Dis* 2009 Nov;15(11):1861–2.
- [18] Reusken CB, Haagmans BL, Müller MA, Gutierrez C, Godeke GJ, Meyer B, et al. Middle East respiratory syndrome coronavirus neutralising serum antibodies in dromedary camels: a comparative serological study. *Lancet Infect Dis* 2013 Aug 8.
- [19] Gautret P, Benkouiten S, Gaillard C, Parola P, Brouqui P. Camel milk-associated infection risk perception and knowledge in French Hajj pilgrims. *Vector Borne Zoonotic Dis* 2013 Jun;13(6):425–7.
- [20] Memish ZA, Mishra N, Olival KJ, Fagbo SF, Kapoor V, Epstein JH, et al. Middle East respiratory syndrome Coronavirus in bats, Saudi Arabia. *Emerg Infect Dis* 2013 Nov;19(11) [ahead of print].

- [21] Fukuda K. Emergence of novel coronavirus: global context. *East Mediterr Health J* 2013;19(Suppl. 1):S5–6.

Philippe Gautret

*Aix Marseille Université, Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes (URMITE),
UM63, CNRS 7278, IRD 198, Inserm 1095,
13005 Marseille, France*

*Institut Hospitalo-Universitaire
Méditerranée Infection,
13005 Marseille, France*

*Aix Marseille Université, URMITE, 27 Bd Jean Moulin,
13005 Marseille, France. Tel.: +33 (0) 491 96 35 35;
fax: +33 (0) 491 96 89 38.

E-mail address: philippe.gautret@club-internet.fr

29 August 2013

Available online 11 September 2013