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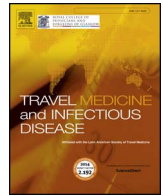
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The study by Yavarian et al. [1] is a major contribution to the field of mass gathering medicine for two reasons. Firstly, this is one among the very few studies addressing respiratory diseases in Karbala pilgrims in Iraq and in Umrah pilgrims to Mecca, Saudi Arabia. Secondly, the design of the study includes a control group selected from the general population of Iran to which pilgrims can be compared. A Shiite Muslim pilgrimage takes place each year in Karbala, an Iraqi city of approximately 500,000 inhabitants located 100 km south-east of the capital, Baghdad. The “Ashura” celebrates the death of Hussein ibn Ali, the grandson of the Prophet Mohammad at the Battle of Karbala on the 10th day of the first month of the lunar Islamic calendar. It is followed by a 40 day-period of mourning. The “Arbaeen” celebrates the end of this 40-day period, gathering millions of pilgrims from inside and outside Iraq. In one study conducted during the celebration day of Ashura in 2010, a 7-fold increase in febrile illnesses was observed compared to baseline activity in emergency units [2]. In another study conducted in Iranian pilgrims participating to the Karbala pilgrimage and referred to Iranian clinics in Iraq in 2013, the main reason for referral was acute upper respiratory tract infection symptoms accounting for 48% of the reasons for admission [3]. In a 2016 study conducted in Arbaeen pilgrims participating to a religious 80 km march from Najaf to Karbala, the authors found that 25% of them were tobacco smokers, making them at risk for respiratory infections [4]. In the present paper, Yavarian and colleagues [1] evidenced by PCR a 14% prevalence of influenza virus carriage in the throat among the 1588 Iranian pilgrims suffering from SARI on returning from Karbala where they celebrated the 2013 to 2015 Arbaeen. This prevalence was of 12% in 2067 pilgrims returning from Mecca and of 9% in 38,511 Iranian citizens from the overall population suffering from SARI and sampled from 2013 to 2015. The odds ratio for influenza infection in ill Karbala pilgrims and ill Mecca pilgrims compared to ill Iranians that did not participate to a pilgrimage was respectively of 1.65 (1.42–1.91, $p < 0.0001$) and 1.40 (1.22–1.60, $p < 0.0001$). Altogether these results confirm that participation to religious mass gatherings in Saudi Arabia or Iraq exposes Iranian pilgrims to a high risk of acute respiratory infections and that part of these infections are likely due to the influenza virus [5]. Vaccination against influenza is therefore highly advisable in pilgrims participating to religious mass gatherings in the Middle East including the Hajj and Umrah [5] and other pilgrimages like those in Karbala. When comparing Umrah and Hajj pilgrims in the Iranian study, it appeared that the proportion of ill pilgrims with influenza was of 4% in Hajj pilgrims and 27.0% in Umrah pilgrims from 2013 to 2015 [OR = 6.19 (4.56–8.41), $p < 0.0001$]. Such a high rate of influenza infections in Umrah pilgrims compared to Hajj pilgrims had never been reported so far. Studies in Umrah pilgrims are scant. One Indian study including Umrah and Hajj pilgrims was conducted in 2014 with an overall 11% of influenza infection in pilgrims suffering from fever and/or respiratory symptoms, but comparison between Umrah and Hajj pilgrims was not provided [6]. The Umrah pilgrimage can be conducted all over the year, while the Hajj rituals officially start on the 8th day of the 12th month of the lunar Islamic calendar, which may possibly have consequences on the viral epidemiology of respiratory infections at the Umrah, as evidenced in the Lavarian study [1]. The Umrah is set to become a mass gathering of major importance and consequence for Saudi Arabia and internationally and clearly, more studies should be conducted specifically in Umrah pilgrims [7].

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