

Coincidence of the Influenza Epidemic Attacks with Special Lunar Months in Iran

Morteza Pourahmad (1,2)
 Abdolreza Sotoodeh Jahromi (1)
 Mohammad Hassan Davami (1)
 Mohammad Reza Yazdani (2)
 Manijeh shams (3)
 Abdolhossein Madani (4)
 Mohammad Hojjat-Farsangi (5,6)

(1) Research center for social Determinants of Health, Jahrom University of Medical Sciences, Jahrom, Iran
 (2) Nosocomial Infection Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
 (3) Islamic Azad University, shahreza, Iran
 (4) Research center for social Determinants on Health Promotion, Hormozgan University of Medical Sciences, Bandarabbas, Iran
 (5) Department of Oncology-Pathology, Immune and Gene therapy Lab, Cancer Center Karolinska (CCK), Karolinska University Hospital Solna and Karolinska Institute, Stockholm, Sweden
 (6) The Persian Gulf Marine Biotechnology Medicine Research Center and Department of Immunology, School of Medicine, Bushehr University of Medical Sciences, Bushehr, Iran

Correspondence:

Abdolreza Sotoodeh
 Jahromi, Research center for social Determinants of Health,
 Jahrom University of Medical Sciences, Jahrom, Iran.
Email: sotoodehj2002@yahoo.com

Received: January 10, 2018; Accepted: February 26, 2018; Published: April 1, 2018. Citation: Pourahmad M. et al. Coincidence of the Influenza Epidemic Attacks with Special Lunar Months in Iran. World Family Medicine. 2018; 16(4):51-55. DOI: 10.5742/MEWFM.2018.93368

Abstract

Introduction: In outbreaks of influenza in a country it seems that religious rituals play an important role (such as Hajj) and regional rituals (such as Ashura mourning). The objective of this study was to determine this relationship in Iran.

Methods: In this cross sectional study we evaluated the frequency of admission of patients with diagnosis of influenza in a central hospital in Isfahan, Iran; in different lunar months, from January 2010 to January 2016. At the end we analyzed our data by SPSS-22.

Results: In this study 873 admitted patients were studied. The total count and the mean of frequency of patients in first till the 6th lunar month (Muharram till Jumada al thani) were significantly more than the number of the patients in the other 6 lunar months ($P = 0.003$).

Conclusion: We emphasize more preventive actions from 12th lunar month (Dhu al Hija) until 6 months later in Iran (and other Islamic countries) because in these months in religious rituals contact between people will happen more frequently.

Key words: Influenza, Lunar months, Outbreak, Iran

Introduction

Influenza epidemics are one of the most important medical events, in various regions of the world. Every year the World Health Organization (WHO) asks all the member states to prepare their plan for a pandemic attack by influenza. This strategy should be a holistic plan to provide education of health care workers at all levels, and institute awareness plans and public health measures (1, 2).

If an influenza epidemic occurs in a country, it will be a difficult and costly event, for that country. Great expenditure will be undertaken from health budgets; such as purchasing antiviral and antibacterial drugs, vaccinations, hospitalizations, etc.

It should be kept in mind that at all times prevention is cheaper than treatment. Therefore, finding ways for prevention is very important as if we can limit the distribution of the disease over the population it will be very worthwhile.

In influenza epidemic attacks in a country it seems there are two important. The first is the entrance of the virus in the country and the second is the distribution of the virus over the population. With attention to these two items, coherence of international and regional ceremonies, may be substantial for entrance and distribution of viral infections (such as influenza) in a country. Religious rituals are very important especially in Islamic countries. Hajj Tamattu ceremony happens every year in the 12th month of the lunar year "Dhu al Hijjah", in which many people from Muslim countries go to Mecca (Saudi Arabia) all together for this religious ceremony. On the other hand, some of the people travel to Mecca in other lunar months and not at this time, which is named Hajj Omrah.

Every year, more than 5 million pilgrims go to Hajj from 184 Islamic countries (3). Two million of these pilgrims are from Iran (4). These pilgrims gather at the same time in a large number in a small area to perform the Hajj rituals (5).

This Islamic ritual consists of several religious actions which begin before the pilgrims reach the boundary of Mecca. They should circumambulate the Kaabah seven times, in masses of pilgrims. After that they should move to the Mina and Muzdalifa. At the end of this ritual; Hajji should shoot the stones at the metaphorical devil and sacrifice a animal such as sheep or goat at designated abattoirs. All of these rituals happen in organized groups of pilgrims (6).

In a mass gathering there is health hazard to the attendees. This hazard is through the transmission of infectious diseases via contaminated water and food, person to person contact and respiratory transmission. We can see a true mass gathering in Hajj which is associated with significant international travel (7).

In addition to this big Islamic ritual; on the other hand, in some of these Islamic countries some regional ceremonies also occur when the pilgrims come back to their countries.

In Iran most people are Shia (a branch of Islam). They believe that Tassua and Ashura are two days of great sorrow due to the tragic events of Karbala. This ritual is in the first lunar month; Muharram; that is the immediate month after the last lunar month; Dhu al Hijjah; in the lunar calendar (when the Hajj ceremony is ended and all of the Hajjis come back to their country). In addition, in Iraq a great meeting occurs in the second lunar month; Safar; in recent years in which many people come together. Therefore, in these religious rituals many people including "Hajjis" come together to respect this event, in streets and mosques all over the cities in these countries. These rituals take place for at least 10 days. In these days it seems that contacts between the patients with influenza (that may come back from Mecca: ie Hajji) with other people can distribute the disease between the people who are involved in the ritual.

Due to these events the epidemics of some infectious diseases (such as influenza) may happen in relation to the lunar months in Islamic countries and not the solar almanac.

In this study we wanted to evaluate the coincidence of the influenza epidemic attacks with the lunar months (especially the lunar months after Dhu al Hijjah (such as Muharram and Safar) so we evaluated the frequency of hospitalization of the patients with diagnosis of influenza in the days of these sacraments in Iran.

Materials and methods

This was a cross sectional study; in which we evaluated all the patients who were admitted in a central hospital by diagnosis of influenza between January 2010 to January 2016. This study was in Isfahan in a multicenter hospital (Al-Zahra Hospital) in which the infectious ward is a central ward in this state.

We referred to the patients records who had been admitted by diagnosis of influenza and the numbers of the patients in each month. After that we referred to the lunar months in the calendar and the frequency of admitted patients in every lunar month.

At the end, we compared the frequencies and the mean, of admitted patients with influenza; in attention to the lunar months.

Because of the shorter duration of lunar years than Gregorian years, in 2011 we had two Moharram months (one in January and the other in December); so we summed the frequencies and calculated for the same year (2011).

Finally the data were analyzed by SPSS version 22 software. For comparing the means between two groups t- test was used; and one-way ANOVA used for comparing the means between more than 2 groups.

Results

In this study 873 patients with diagnosis of influenza were enrolled.

The frequencies of the patients who attended to the hospital by the diagnosis of influenza from January 2010 to January 2016 are in Table 1. We evaluated the number of the patients in the lunar months.

The difference of the means of patients count in every year from 2010 till 2016 was not significant (P value = 0.370), but the numbers of the patients between the first and second 6 consecutive lunar months of every year was significant (P value = 0.003).

It seems that the total count of patients in Muharram till Jumada al thani were more than the number of the patients in other 6 months. On the other hand, the mean of the frequencies is also higher in these months.

More evaluation showed that the mean of the numbers of the patients in every 2 months was decreasing from the first months till the last months of every year (Table 2).

Discussion

This study showed that the prevalence of influenza is concentrated in about 5 consecutive lunar months in Iran; in which some Islamic religious rituals occur. The first lunar month is Muharram and the fifth month is Jumada al Awwal. These 5 months are after Dhu al Hijjah in which the Hajj pilgrims move to Saudi Arabia for Hajj ritual. This ritual is one of the greatest mass gatherings with about 5 million people from all over the world (7). These pilgrims gather every year in Mecca in Dhu al Hijjah (3, 8), and are exposed to various infectious agents (9).

After the end of this ritual the pilgrims come back to their countries and they bring home various infectious agents in addition to souvenirs (9).

Pellerin et al. reported that influenza is an infectious disease that may be seen to be associated with religious rituals; he reported that this is in addition to other infectious diseases such as meningococcal meningitis, vibrio cholera diarrhea and tuberculosis in Hajj/Umrah mulim ritual (10).

Table 1: The frequency of the patients with influenza in different lunar months from Jan 2010 to Jan 2016

Lunar months Year	Muharram	Safar	Rabi al Awwal	Rabi al Thani	Jumada al Awwal	Jumada al Thani	Rajab	Shaban	Ramadan	Shawwal	Dhu al Qi'dah	Dhu al Hijjah	Total
2010	40	40	16	10	7	1	0	1	2	1	0	1	119
2011	10	19	21	22	11	1	0	0	0	0	0	2	86
2012	6	22	17	2	2	6	0	2	0	0	0	0	57
2013	0	14	11	10	0	0	1	0	1	0	1	1	39
2014	1	11	5	3	4	0	8	13	7	2	0	5	59
2015	4	2	10	14	16	9	0	0	2	1	0	4	62
2016	7	71	201	108	53	6	5	0	1	2	1	1	451
Total	68	179	281	169	93	23	14	16	12	4	1	13	873
Mean/ month	9.7	25.5	40.1	24.1	13.3	3.3	2	2.3	2	0.7	0.2	2.17	10.91

Table 2: Means of the number of the patients with influenza in every 2 consecutive lunar months in 7 years' evaluation

2 months (first to 6 th)	Means of the number of the patients
First (Muharram, Safar)	17.6
Second (Rabi al Awwal, Rabi al thani)	31.4
Third (Jumada al Awwal, Jumada al thani)	8.2
Fourth (Rajab, Shaban)	2.1
Fifth (Ramadan, Shawwal)	1.3
Sixth (Dhu al qidah, Dhu al Hijjah)	1.1

P value = 0.009

Hashim et al showed that the prevalence of respiratory diseases was 93.4% in 468 Malaysian pilgrims in 2013 (11) and Razavi et al reported that the most prevalent disease is the common cold in these pilgrims in Iran (4) and therefore; one of the most infectious agents is influenza virus. Our study shows that this agent will enter our country in Du al Hijjah and then will exist for five consecutive months between the people.

WHO have some plans to ensure the wellbeing of pilgrims in Saudi Arabia (12) but we recommend that these efforts should be continued into the countries to reinforce global health security. These global health initiatives should be converged with all the Islamic countries.

We know that when the pilgrims return home, they celebrate their come back and invite their relatives and friends. In this celebration they embrace and kiss their friends and relatives and this provides further opportunities for the spread of infectious agents.

After this opportunity for infection, Muharram will begin and Shia rituals will start. In this ritual that may continue for at least 2 months we have mass gathering in mosques and other religious sites. This facilitates more distribution of infectious agents.

It should be said that the lunar calendar is the base for Islamic rituals such as Fasting and Hajj; and we know that the months of the lunar calendar are not accordant with the solar calendar. On the lunar calendar each month is 11 days less than the solar calendar; therefore, each lunar month may happen in different times to the solar calendar in different years. For example, in 2011 Muharram was in January but in 2015 it was in November.

In Iran also the Shia rituals are based on the lunar calendar. One of the most important of these rituals is Ashura mourning; in which during 10 days all the people who believe the tragic events of Karbala come together in mosques and the other mourning sites to do their weeping ritual.

Although, Ashura mourning happens in the first 10 days of the first lunar month; Muharam, but it will be continued for 2 to 3 months with milder intensity. Muharram, is after the 12th lunar month; Dhu al-Hijjah in which Hajj ceremony occurs. Therefore, many of the people who have referred from Mecca will contribute in these mornings and can transmit their viral infection to healthy people; and after that everyone who has the virus can transmit it to their family and friends. Therefore, an international and after that a regional transmission of the virus occurs.

Our results emphasize these events and therefore we should have programs for this transmission of virus.

Ibrahim et al showed in their study that, the pilgrims who didn't receive health educational advice before Hajj are more prone to infectious diseases. They recommended that health education activities should be intensified before the Hajj to raise awareness of pilgrims about health-related behaviors (8). With attention to our study

we should intensify our efforts for health before Hajj but it should be continued for a further five months.

Non-pharmaceutical measures such as wearing face masks, hand wrapping and keeping away from symptomatic patients are effective to reduce the spread of infectious agents from person to person (13). These actions should be our recommendations to everybody in religious rituals such as Hajj and Ashura mourning.

Although vaccination and antiviral drugs are the mainstay of influenza; Hashim et al. showed that risk of respiratory illness is significantly low in Malaysian Hajj pilgrims with regard to good hand hygiene (11). This item is easily applicable in Muslims because they should have ablution before every prayer (five times a day) (11). In addition, Imani et al. concluded from their study that vaccination against influenza should stop and it is better to save it for the people of high-risk condition such as children, immunocompromised individuals and elderly. They emphasize on the relevance of implementing hygienic precautions (14).

Other authors recommend honey for preventing common cold and influenza (15). Sulaiman et al. suggested that pilgrims begin taking honey a few weeks before journey to have the maximum preventive effect (16).

We should pay special attention toward the elderly in these religious rituals because they almost all have strong belief and participate in these rituals and they are more prone to infections. Khan et al. revealed in their study that most patients were elderly with chronic medical disorders (17).

With attention to the above we emphasize preventive measures before moving to Mecca for all Hajj pilgrims and it is more important to continue these measures after returning to their county and in ceremonies that will happen after that; especially returning celebrations and Ashura carnivals.

Conclusions

Overall this study showed that frequency of influenza will be increased in specific times which coincide with ritual ceremonies in Muslim countries. Therefore, our recommendations are attention to preventive measures before these ritual ceremonies and we emphasize that these preventive actions should continue for at least 6 months after Dhu al-Hijja in lunar calendar.

Acknowledgements:

Authors, hereby thank all the persons who sincerely cooperated and help us for preparing the information for this study; specially the Isfahan and Jahrom university of medical sciences.

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