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Epidemiology of Hepatitis A Virus Infections in Syria, 2017; War and Asylum Seekers: A Global Threat

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Abstract

Breakdowns of the 7-year war in Syria, especially in the health care infrastructures, such as water networks, and in the basic health requirements, such as public hospitals, emergency equipment from one side and emigration of the skilled resources from the country from the other side, has led to a disaster not only for the residents and neighboring countries but also for all other countries, which accept asylum seekers. Deficiency of national immunization programs and safe water has increased the risk of new epidemics of enterally transmitted virus infections like Hepatitis A virus (HAV) infection. Ringing alarms of a public health emergency must concern all authorized policy makers around the world. Vaccination against HAV, both for residents and asylum seekers, controlling the immune system of all other nations involved in Syria, fixing the water networks, and investing on infrastructures of the primary hygiene requirements would eliminate the risk of communicable infections in all the region.

Keywords: Hepatitis A Virus, Epidemiology, War, Asylum Seeker, Syria

1. Breakdowns of War in the Health System of Syria

After 7 years of civil war in Syria, as the worst humanitarian crisis of the 21st century, which led to displacement of 6.5 million Syrians (1), the crisis is growing much faster than expectations, especially in terms of catastrophic problems of transmitted diseases. No imminent solution is at hand neither for bringing an end to the conflict in Syria nor for the public health of its citizens. Breakdowns of war destroyed 40% of Syria's ambulances and severely damaged 57% of public hospitals. Consequently, about 160 doctors were killed and around 80 000 of them emigrated. Only essential medications (10% of all pharmaceutical needs) could be found in the country, according to the WHO (2, 3). Deterioration of health institutions in Syria has led to emigration of women and children to the neighboring countries, especially to Lebanon, Jordan, Turkey, Iraq, and Egypt (4, 5). Most of them have moved to poor areas without primary health conditions. Over a million refugees in Lebanon and around 3500 per day (crossing border) in Jordan utilize local health care resources ranging from continued chronic care to the management of spreading communicable diseases. Due to a lack of proper health supervisions for women, their children do not receive enough HBV vaccination, which leads to an increase in the burden of HBV in the region.

War complications, such as mental health, trauma, and public health support remain a pivotal challenge for the entire Syrian population both in the neighboring host countries and inside the war-torn country. Many previously vaccine-preventable diseases have spread quickly after forgetting the immunization programs. Vaccination coverage have dropped from 91% in 2010 to 45% in 2013 (1). More than 50% of all Syrian children born since the conflict (900,000) are unvaccinated. Syrians are experiencing terrorism and oppression and suffering from many new epidemics of enterally transmitted virus infections, like hepatitis A virus infections (6).

The HAV virus lives in sewage, water, and contaminated food. In Syria, raw sewage is pumped directly into rivers, which provides drinking and washing water to villages, and chlorination has been discontinued since 2012. Spreading the new epidemics of previously controlled infectious diseases, such as viral hepatitis infections, will lead to transmission not only to vulnerable populations in Syria but also to the neighboring countries. Therefore, announcement about these new epidemics rings alarms for all authorized health policy makers in the region as well as

a public health emergency units of global concern (7).

2. Methods

Search of major databases, like PubMed, Scopus, and ISI Web of Sciences from 2000 to 2017, using keywords of Syria, War, Conflicts, Health, and Asylum seekers provided enough background data. On the other hand, the WHO website and news agencies were searched for gathering information about "socioeconomic" complications of war in Syria.

3. HAV Epidemic in Syria

Hepatitis A Virus infection is usually transmitted by the fecal-oral route, most frequently via contaminated food or water or close contact associated with poor sanitary conditions and low socioeconomic status like war and famine.

While its infection causes an acute benign disease among children less than 6 years old, it could lead to fatality ratios of up to 1.8% in adults older than 50 years of age and may even lead to acute liver failure (6, 8, 9). The most effective method of prevention is vaccination of all children at age of 1 year. In Syria, vaccination against HAV was not included in the Extended and Routine Program on Immunization neither before 2011 nor afterwards.

Before the conflict, a gradual shift in the age of acquiring HAV to older age groups was reported in Syria because of enhanced sanitation of drinking water, increased promotion of personal hygiene, and improvement in the socioeconomic conditions (10, 11). Unfortunately, after 4 years of war, all of these conditions were altered and risk of HAV contamination increased dramatically so that just last year, international health workers diagnosed 31 460 HAV cases in Syria, a number that seems to be growing as an internal conflict in the country continues (12). A rising outbreak of HAV infection is spreading across Syria, with local doctors reporting nearly 1000 new cases every month in the region since January 2016, according to the world health organization (WHO) and reported by Reuters. In addition to HAV, WHO also warned against emerging epidemics of typhoid and cholera in the region due to the pollution of water. Safe water, as the latest battleground in Syria, is not accessible for almost 70% of the normal population (22 million) resulting in a rise of waterborne diseases. Water from the Wadi Barada and Ain al-Fija springs, which serve 70% of the population in and around Damascus, was cut after infrastructure was damaged in fierce clashes.

Considering the below facts, HAV epidemiology has increased dramatically in the recent years resulting in increased symptomatic infection rates as well as morbidity and mortality:

1) Syrian children had a high sero-prevalence of HAV infection

2) Epidemiologic shift in the HAV acquisition age to an older age occurred after 2005

3) Destruction of the water network and lack of safe water because of the recent conflict has occurred after 2011

4) Lack of basic vaccination (expensive and out of availability) and control of immunization against hepatitis occurred after 2011

5) Lack of personal hygiene and socioeconomic crisis

The HAV infection epidemic is creating an important health crisis that will require immense resources. The first report of HAV infected people among Syrian Arab Republic during year 2012 detected 2,203 patients. On the other hand, its prevalence among Lebanese republic were increased from 448 patients in 2011 to 1551 patients in 2013 (1).

4. Spreading the HAV in the Region and Worldwide: Our Role

Transportation and spreading of HAV infection to a nearby country of Syria is not far from reality as death occurred due to hepatorenal syndrome in a 14-year-old Turkish boy just after 3 months (13). Other than neighboring countries, asylum seekers have spread outbreaks of HAV infection in European countries. Between 2015 and 2016, HAV increased by 45% (to 699 patients) in a population of asylum seekers that moved to Germany. Most of the cases were aged 5 to 9 years old and analyzing of HAV virus sequences proved that the source of infection was from the Middle East, Turkey, Pakistan and East Africa (14, 15). Incidence of HAV was 32 per 100,000 in Asylum seekers compared to 0.5 per 100,000 in normal residents (incidence ratio: 63, 95% CI). This clearly shows that the refugee crisis is not limited only to Middle Eastern countries as more than 800,000 of them entered Germany in 2015.

5. Action Plan for Control

Regarding control and haltering of the mentioned epidemic of HAV, this study strongly recommends:

1) Authorized international organizations should start to prepare HAV vaccination among all high risk groups of children. Hepatitis A Virus vaccination has been commercially available and proved to be effective. Considering the high morbidity and mortality rate of HAV infection in older age ranges, it is recommended to include HAV vaccination as part of the routine vaccination of children.

2) All adults less than 30 years of age and all soldiers and those who will be or were involved in the conflict in

Syria and soldiers from western countries should be vaccinated.

3) Providing HAV vaccination for all high risk groups of Syrian residents as well as asylum seekers is necessary to protect against this virus by direct support of pharmaceutical companies through WHO commitments

4) Neighboring countries that accept refugees try to eliminate HAV infection in high risk groups using HAV vaccination in children and registering new cases including older people

5) Investment on water network project, even without direct financial profits, would help Syrian people in the first line of hygiene requirement and indirectly eliminate risk of enterally transmitted infections in all countries of the region

Although there is an increase of HAV infection in Syria and its asylum seekers, Hepatitis E virus should not be neglected in the same situation (8, 9). Both sero-prevalence and complications of HEV infected patients (up to 17% in high risk populations (16-18)) have forced greater susceptibility against this virus, especially in hygienic crisis of war. Infection of HEV is another major oral-fecal transmitted infection (19), which must be considered as another challenging problem of the region and worldwide (20, 21).

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