

Hepatitis A virus outbreak in Lebanon

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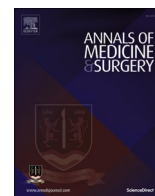
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Hepatitis A virus outbreak in Lebanon: Is it a matter of concern?

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ABSTRACT

Lebanon has been grappling with hepatitis A virus (HAV) outbreaks for 3 decades, to an extent that it has been now termed an endemic zone for HAV. However, the rise in cases above the annual average concerns a potential outbreak in the North, and the Bekaa governorates of Lebanon must be highlighted. Although the Lebanese health authorities have ordered a probe into the possible causes of the outbreak, it has been speculated that the immigration of Syrian refugees has overburdened public health services. Reduced seroprevalence of HAV immunoglobulin G has also led to an epidemiological shift from child to adult populations. The current economic crisis affecting Lebanese society is another significant problem that could have contributed to the rise in incidents. This article examines Lebanon's current HAV outbreak and epidemiological status, offering suggestions for the future. In the event of an outbreak, the infrastructure for water sanitation and sewage is known to allow HAV to spread via the faecal-oral pathway. Maintaining personal hygiene, early detection, and vaccination have all been recommended as significant regional and individual control measures.

1. Introduction

With reported epidemics in numerous nations worldwide, viral hepatitis has been a formidable threat since ancient times [1]. Hepatitis A virus (HAV) is among the most common causes of viral infections globally [2]. Most commonly, the disease is spread via ingestion of contaminated food, water, or by direct contact with affected individuals [3]. Contact with contaminated surfaces, drug injections, and rarely blood transfusions are additional potential routes of infection [4]. Socioeconomic level and hygienic circumstances have a significant impact on HAV infection rates [3,5]. Poor sanitation, a lack of clean water, recreational drug use, foreign travel to high endemicity, and low immunisation rates are among risk factors, according to the World Health Organisation [6].

Lebanon had suffered numerous difficulties in recent years, beginning with the coronavirus disease 2019 (COVID-19) pandemic that started in December 2019 and continuing with the economic and financial crises that most of the Lebanese populace had experienced [7]. Recently, a new challenge has evolved in the form of an outbreak of viral hepatitis (HAV specifically), which started mainly in Northern Lebanon [8]. Even before the pandemic, Lebanon was subjected to considerable economic challenges, which worsened with the pandemic, resulting in economic fallout. This fallout caused more than half of the Lebanese population to fall below the poverty line [7]. As a result, living conditions have been deteriorating, as well as individuals suffering from a dire shortage of several crucial drugs and vaccines, including the HAV vaccine [9]. Moreover, Lebanon has always faced weak infrastructure and widespread pollution [7]. All these are among the risk factors that contribute to the increased risk of acquiring HAV among the Lebanese population [6]. Additionally, another significant aspect might be the influx of Syrian refugees into Lebanon [10].

2. Epidemiology and outbreak of Hepatitis A virus in Lebanon

According to Lebanese Ministry of Public Health- Epidemiological Surveillance Unit (LMoPH-EUS) data published on June 25, 2022, HAV has demonstrated a re-emergence outbreak in Lebanon in 2022 that has reached 609 cases [11,12]. According to the ministry of public health in Lebanon, most cases are of residents in the North and Bekaa governorates [11]. The Bekaa governorates have harboured 231 confirmed cases with an increase in May, June and July shown to be linked to the water contamination and infrastructure deterioration, aiding the mixture between drinking water pipes and sewage water [11]. HAV is known for being transmitted through the faeco-oral route which mirrors the safety of water sanitation and sewage infrastructure [11]. Moreover, the north governorate has shown 278 cases this year, yet the ministry is still speculating the origin of the spread [11]. The distribution of the disease shows a great impact mainly on the youth as 32.5% of cases aged 10–19 years and 29.8% aged 20–39 years, respectively [11]. HAV infection in Lebanon has a predominance for young adults who are at an increased risk of contracting the disease [14]. Lebanon has encountered multiple HAV outbreaks during the past 3 decades, the annual average number of cases ranging from approximately 300 cases between 2001 and 2012 rising to 2600 cases in 2013, especially in the governorates of North and Bekaa [13]. As the number of cases this year has risen above the annual average, concerns regarding potential outbreaks alongside the rise of cases must be highlighted [10]. It must be noted that the Lebanese population witnessed a drop in the HAV immunoglobulin G (IgG) seroprevalence between 2001 and 2013. Yet, with the Syrian war and the migration of Syrian refugees, there was a rise in the prevalence of the disease. Also, annual cases alongside the influx of Syrian refugees, demonstrated 14–18% of cases being reported [10] (See Fig. 1 and Fig. 2). The current economic crisis and the degradation in the economic standing of Lebanese society are critical issues that could have an impact on the spread of the disease and the rise in the number of cases during

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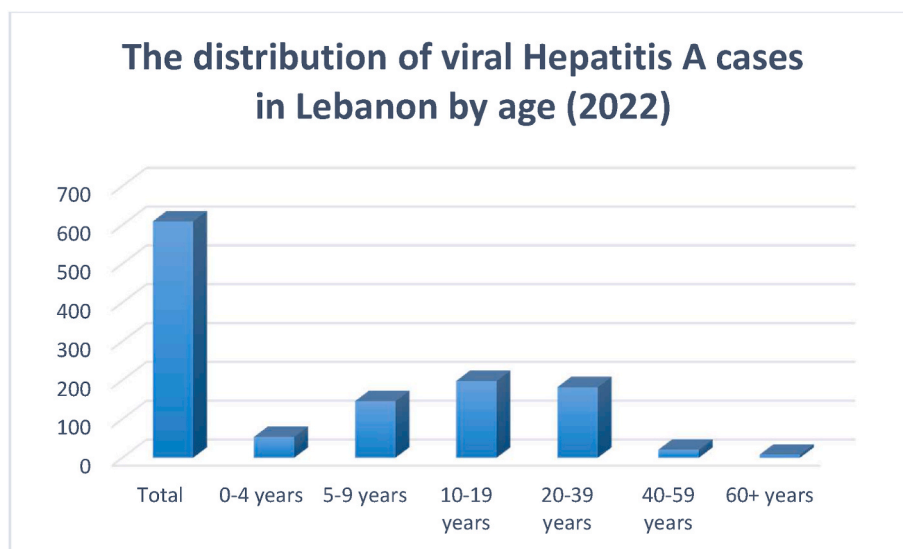


Fig. 1. The distribution of HAV cases in Lebanon by age (2022).

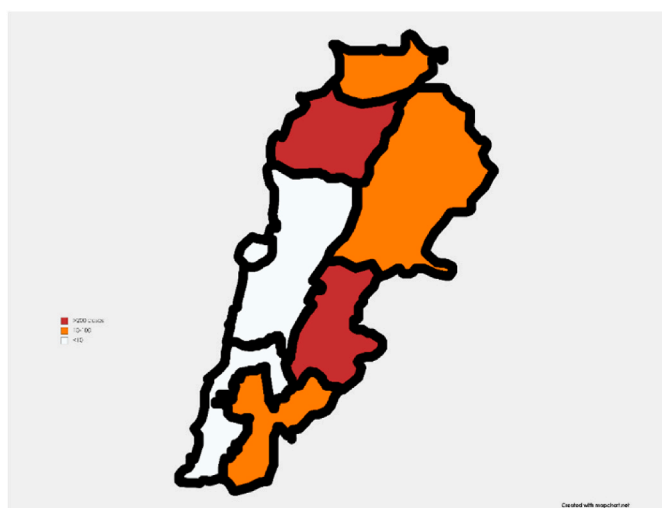


Fig. 2. A map of Lebanon showing the distribution of HAV cases among the Lebanese governorates in 2022.

the past five years [10,11,14].

3. Aetiology of Hepatitis A virus

Local media has claimed that the outbreak was caused by contaminated drinking water and that HAV infections were initially discovered in the northern city of Tripoli [15]. This claim has not been corroborated by concerned authorities [15]. Moreover, the rapid spread of HAV is concerning, as it reflects such dissemination as the coronavirus disease 2019 (COVID-19) pandemic. This highlights how highly contagious HAV is [15]. This is a result of the sewage system's pollution of the drinking water and poor hygiene standards [15]. However, the investigation revealed that the public water was not contaminated, suggesting that the faeco-oral route of this virus may be spread by inadequate hygiene after using the restroom and before eating [15]. In addition, the absence of the HAV vaccine in Lebanon is an additional factor for rapid viral spread [15]. Also, public health officials consider potential contamination occurring in late April when work was conducted on a local water supply [16]. There may be a small populace who have HAV but are unaware, according to a physician in Tripoli [16]. Additionally,

HAV has an incubation period of 2–4 weeks, infecting hepatocytes of the liver as an extremely contagious pathogen associated with poor hygienic practice [16]. Due to the devastating economic downfall of the nation, a significant proportion of Lebanon, particularly Tripoli, is now impoverished [16]. The government's electrical provider only provides power for a few hours each day, and the local currency has lost more than 90% of its value [16]. It is understandable that some individuals would not have full access to clean water [16]. Additionally, it was discovered that groups with lower levels of education had a higher prevalence of anti-HAV antibodies [17]. Further, no association between anti-HAV seropositivity rate and gender was discovered, supporting findings from an earlier investigation in Lebanon [18].

4. Current efforts to mitigate Hepatitis A virus in Lebanon

On Monday, the Health Ministry declared that it had been monitoring the outbreak ever since it started, still investigating its origins [15]. According to the ministry, a daily report will be made public, just as it was in the case of the COVID-19 pandemic [15]. The head of the Doctors Syndicate, Youssef Bakhsh, has warned that HAV is particularly dangerous due to its swift dissemination and rising case numbers [15]. He blamed the illness on inadequate sanitation, a lack of drinking water, and a malfunctioning sewage system [15]. He complimented the Lebanese Health Ministry for cooperating with the appropriate agencies to look into the epidemic and sources of associated pollution [15]. The inquiry, he claimed, had revealed that the public water supply was not contaminated, and 118 cases had been identified in less than a week [15]. Bakhsh advised individuals to use appropriate hygiene practices, such as handwashing after using the bathroom and before meal preparation and consumption, drinking only from reputable water sources, and meticulously washing fruits and vegetables before eating [15]. He underlined the significance of distributing proper vaccinations and implementing an immunisation programme that targets society's most vulnerable populations, the elderly, and individuals with ongoing health issues [15]. Prioritising early disease identification will help isolate patients and prevent the spread of the virus [15]. HAV vaccines are not readily available in Lebanon, according to Joe Salloum, president of the Order of Pharmacists, forcing the declaration of a public health emergency [15]. Officials in charge of public health authorities are currently working to put an end to the pandemic and make sure that the water supply in the region is safe to drink [16]. The United Nations agency for children also works to guarantee that everyone has access to clean water [16].

5. Recommendations

As northern Lebanon collapses in one of the most dangerous outbreaks of Hepatitis A, an investigation has been ordered by the Lebanese health department into the possible cause of the outbreak [13]. Despite this, numerous reports and previous epidemics have revealed that Lebanon’s hefty sanitary infrastructure and public health services are the key contributors to the outbreak [13,19–27]. There are still several additional methods that can help manage the outbreak at local and regional levels [13]. At the individual level, good hygienic practices should be reinforced, including handwashing after using the restroom and before meal preparation or consumption, utilising dependable water sources, or cleaning products to minimize HAV incidence [13]. Lebanese health authorities and the international community need to intensify their efforts to monitor, isolate and prevent the spread of infectious diseases [13,28–32]. Early detection should be a priority as it helps to address the outbreak in the early stages leading to a better plan of action by relevant authorities [13]. Subsidising treatment for HAV based on nationally adopted guidelines and ensuring vigilant sanitisation of drinking water facilities may aid in achieving a low prevalence state of HAV in Lebanon [13]. Providing appropriate well-equipped toilets and

free immunisations for affected communities are effective solutions to contain HAV outbreaks [13]. Further emphasis should be put on the immunisation of vulnerable populations, like the elderly and those suffering from co-morbidities [33–35]. However, financial constraints and the need to prioritise health budgets put constraints on HAV vaccine administration. These suggestions can help prevent future epidemics in these nations as well because the situation in Lebanon can also be witnessed in other nations with sizable refugee populations [13] (see Fig. 3).

6. Conclusion

Re-emergence of HAV with more than 600 cases has been termed the worst outbreak in three decades, in the northern and Bekka governorates. The immigration of refugees from Syria and overburdening of the already strained public health services have been speculated as the primary cause of the outbreak. Reduced seroprevalence of HAV IgG, has also led to an epidemiological shift from child to the adult population. Several recommendations on individual and regional levels like maintaining hygiene, early detection, and vaccination have been advised to curb the current outbreak of Hepatitis A.

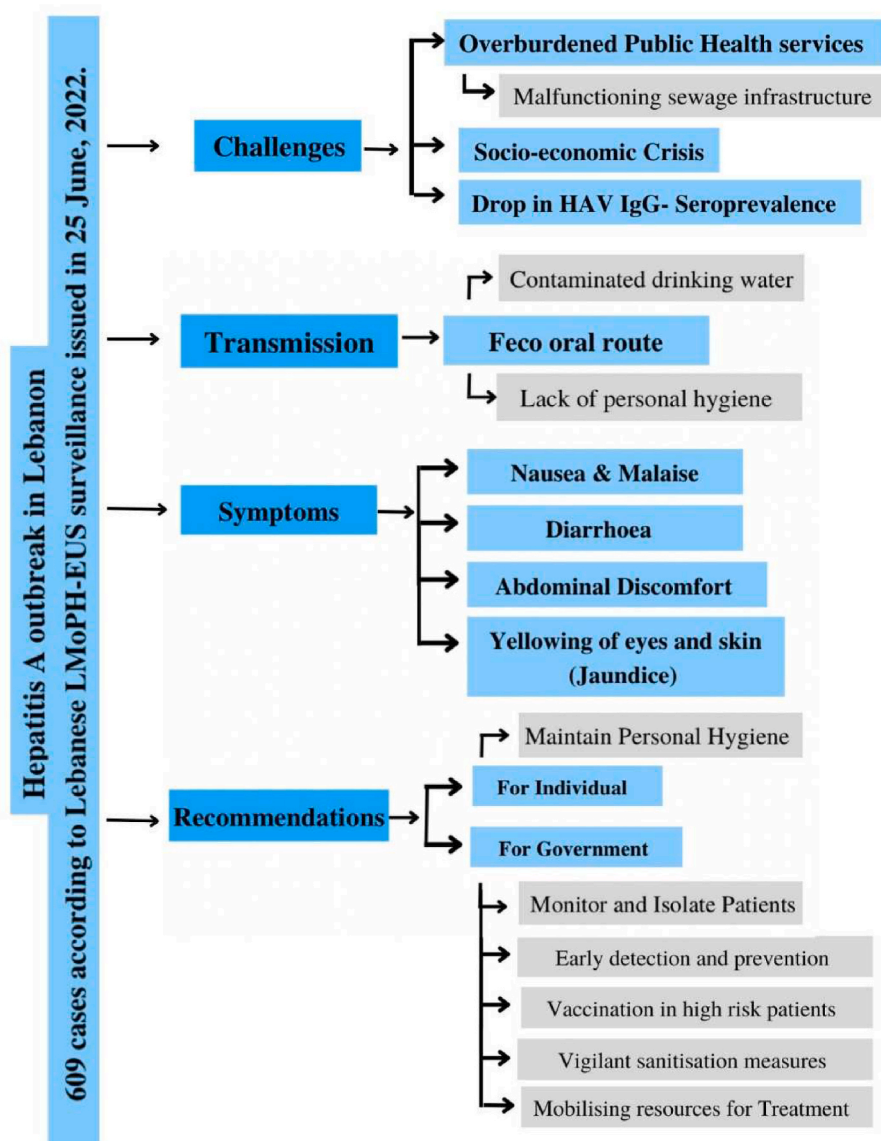


Fig. 3. A summary of Hepatitis A virus outbreak in Lebanon.

Ethical Approval

Not Applicable.

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None.

Author contribution

Olivier Uwishema: Conceptualization, Project administration, Writing-review and Designing, **Mortada Abbass:** Collection and assembly of data, **Olivier Uwishema:** Reviewed and edited the first draft, supervisor, **Jack Wellington MSc (LSHTM) FGMS:** Reviewed and edited the second draft, **Helen Onyeaka:** Reviewed and edited the final draft, Supervisor.

Registration of research studies

1. Name of the registry: **Not Applicable**
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Guarantor

Olivier Uwishema; Principal Investigator (PI)

Consent

Not Applicable.

Declaration of competing interest

No conflicts of interest declared.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.104585>.

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