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Mini Review

Occupational Immunization Against Hepatitis A in Healthcare Workers: A Mini Review and a Practical Protocol for a Tertiary Hospital

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Abstract

Hepatitis A Virus (HAV) remains a relevant occupational hazard for healthcare workers, who may be exposed through direct patient contact or the handling of biological materials, and nosocomial outbreaks have been repeatedly documented. Recent large multi-country outbreaks in Europe, including Portugal, have renewed attention to hepatitis A prevention. This mini review summarizes current evidence on the occupational risk of hepatitis A among healthcare workers, the immunogenicity and duration of protection of inactivated hepatitis A vaccines, and the role of pre- and post-exposure prophylaxis, and translates this evidence into a practical, guideline-based occupational immunization protocol for a tertiary hospital. The protocol was synthesized from current national and international immunization guidance into a stepwise procedure covering risk assessment, evaluation of immune status, standardized pre- and post-exposure vaccination schedules, outbreak management, and post-vaccination monitoring. Human normal immunoglobulin is considered when active vaccination is contraindicated, unavailable, or indicated for vulnerable individuals. Standardized documentation and adverse-event reporting procedures are detailed to support occupational health practice and infection prevention and control. Implementation of a structured protocol is intended to improve protection of healthcare workers, reduce occupational transmission of hepatitis A, and harmonize vaccination practice across hospital services. The approach is practical, guideline-concordant, and readily transferable to other tertiary care institutions.

Keywords: Healthcare workers; Hepatitis A vaccine; Hepatitis A virus; Immunization; Infection prevention and control; Occupational health; Post-exposure prophylaxis; Tertiary hospital

Introduction

Hepatitis A Virus (HAV) is a highly contagious, non-enveloped RNA virus transmitted primarily through the faecal-oral route, either person-to-person or via contaminated food and water [1]. Although infection is frequently self-limiting, it can cause significant morbidity, hospitalization, and work absence, and the risk of severe disease and mortality increases with age [2]. The Global Burden of Disease study estimated 159 million acute HAV infections worldwide in 2019, and improvements in sanitation in transitioning countries have paradoxically increased the pool of susceptible adults, raising the potential for outbreaks [2,3].

Healthcare workers are at increased risk of exposure through direct patient contact and the handling of biological materials, and nosocomial transmission from patients to staff is well documented, with nurses often accounting for most infected personnel and reported attack rates reaching 15-41% in outbreaks [4]. Seroprevalence among healthcare workers varies widely across settings and occupational categories [4]. Large multi-country outbreaks in the European Union and European Economic Area between 2016 and 2018, predominantly affecting men who have sex with men but with spillover to the general population, and more recent outbreaks in Portugal, have renewed attention to hepatitis A prevention and to the protection of exposed staff [5-7].

Vaccination and timely post-exposure prophylaxis are the principal strategies for preventing occupational transmission [8-10]. Inactivated hepatitis A vaccines are highly immunogenic and provide long-term protection, with modelling studies estimating protection lasting several decades after a com-

plete two-dose schedule [11,12]. Post-exposure prophylaxis with hepatitis A vaccine or immunoglobulin is effective when administered within two weeks of exposure [9,10]. Despite national recommendations, implementation varies considerably across hospital settings, with heterogeneous approaches to risk stratification, serological screening, and post-exposure management [8,13]. This mini review summarizes the evidence underpinning occupational hepatitis A immunization and translates it into a standardized, guideline-based protocol for healthcare workers in a tertiary hospital, describing its operationalization into a defined workflow with the aim of harmonizing practice and strengthening infection prevention and control [8,13,14].

Occupational Risk and Rationale for Immunization

The occupational risk of hepatitis A among healthcare workers derives mainly from contact with infected patients during the period of peak viral shedding, particularly when diarrhoea or faecal incontinence occurs, and from the handling of biological materials [4]. The risk is greatest when an index patient is admitted with a diagnosis initially unrelated to HAV, delaying the implementation of enteric precautions [4]. Reviews of reported outbreaks and sero-epidemiological studies have identified staff in neonatal, paediatric, and intensive care units, as well as nurses and auxiliary personnel, as groups warranting particular attention, and have supported pre-employment screening and vaccination of susceptible staff in high-risk settings [4]. National guidance in Portugal has recently defined an immunization strategy against hepatitis A, providing the framework within which hospital occupational health services organize staff protection [8,13].

Inactivated hepatitis A vaccines are licensed for use from 12 months of age and are administered as two intramuscular doses; effectiveness studies have demonstrated long-term protection, and the vaccines have a very favourable safety profile [2]. Long-term follow-up and modelling studies estimate persistence of protective antibody concentrations for several decades in healthy adults after a complete schedule [11,12,14]. In immunocompromised individuals, including people living with HIV and those on immunosuppressive therapy, seroprotection rates are lower and may wane, which is relevant when assessing healthcare workers with such conditions [15].

Protocol

The protocol was developed by synthesizing current national guidance [8,13] and international recommendations [14], and adapting them into an institution-specific operational workflow coordinated by the occupational health service of a tertiary hospital. Rather than restating existing recommendations, the protocol defines who is responsible for each step, how immune status is determined and recorded, and how pre-exposure, post-exposure, and outbreak scenarios are managed in routine practice. The protocol comprises four operational components, described below.

Identification and risk assessment:

At-risk healthcare workers are identified through a service- and role-based risk map maintained by the occupational health service. Departments with the highest likelihood of exposure to HAV, such as gastroenterology and infectious diseases, are classified as priority services. Because the current national immunization guidance is recent [8], workers in these priority services were actively recalled for a structured catch-up assessment rather than waiting for routine periodic occupational health appointments. Risk stratification considers direct patient contact, the handling of biological materials, and involvement in the management of confirmed cases or outbreaks [8,13].

Immune status assessment:

Immune status is established from documented prior infection, a reliable vaccination history, or serological testing [8,13]. When immunity is not documented, total anti-HAV IgG is requested, with the threshold for a protective (positive) result defined by the reference laboratory. Workers with confirmed immunity require no further action; those with negative or equivocal results are referred for vaccination [8].

Vaccination schedule and administration:

Pre-exposure vaccination is offered to all susceptible at-risk healthcare workers using a two-dose schedule of monovalent hepatitis A vaccine administered at day 0 and 6-12 months (Table 1) [8,13]. The combined hepatitis A and B vaccine is used when protection against both viruses is indicated [14]. Vaccination is prescribed and delivered within the occupational health service: the vaccine is administered by nursing staff, who document each dose both in the internal occupational health record and in the national vaccination registry to ensure traceability and continuity of care. Available vaccines and schedules are summarized in **Table 1** [8,13,14].

Post-exposure management:

Post-exposure prophylaxis is triggered by an occupational exposure event, typically reported as a workplace accident. The exposed worker is first assessed in the emergency department, where existing evidence of immunity or prior vaccination is reviewed. When prophylaxis is indicated, the decision between active vaccination and human normal immunoglobulin (HNIG) is made by the infectious diseases service in collaboration with occupational health, taking into account the interval since exposure, the worker's age and immune status, and individual risk factors [9,10]. Current recommendations favour hepatitis A vaccine for post-exposure prophylaxis in healthy individuals, with immunoglobulin reserved for older or vulnerable persons depending on risk assessment [9,10]. Prophylaxis is administered as soon as possible and within 14 days of the last exposure [9,10]. HNIG is considered when active vaccination is contraindicated, unavailable, or indicated for vulnerable individuals [10]. The exposure and the prophylaxis provided are subsequently communicated to the occupational health service, which assumes responsibility for follow-up.

Table 1: Hepatitis A vaccination schedule for adults.

Vaccine	Age group	Dose	Route	Number of doses	Dosing interval
Havrix	≥ 16 years	1440 ELU/1 mL	IM	2	0 and 6–12 months
Vaqta	≥ 18 years	50 U/1 mL	IM	2	0 and 6–18 months
Twinrix Adult	≥ 16 years	1 mL	IM	3	0, 1, and 6 months

ELU: ELISA units; IM: intramuscular.

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Post-vaccination monitoring, follow-up, and outbreak control:
Vaccinated personnel are observed for at least 30 minutes after administration, and adverse events are reported to occupational health and to the national pharmacovigilance system (INFARMED, Portal RAM) [8]. Longitudinal follow-up of exposed and vaccinated workers is coordinated by the occupational health physician. In the event of an outbreak, the occupational health service activates the response plan, ensures prompt vaccination of susceptible contacts, and reinforces standard infection prevention and control measures, including hand hygiene and environmental cleaning [8,13,14]. The hospital infection control committee may be involved, usually at a later stage, since the initial pathway for a potential occupational exposure runs through the emergency department and the occupational health service. Detailed records of exposures, vaccination, and follow-up are maintained throughout [8,13].

Discussion

A standardized, institution-specific protocol for hepatitis A offers advantages over the direct application of national guidance alone. By assigning clear responsibilities across the occupational health, emergency, and infectious diseases services, the protocol reduces ambiguity in both routine vaccination and post-exposure situations, where timely decisions are critical [9,10]. Anchoring identification in a service- and role-based risk map allows priority departments, such as gastroenterology and infectious diseases, to be addressed first, which is particularly relevant during the catch-up phase that follows the introduction of recent national recommendations [8]. This approach is consistent with the recommendations arising from reviews of nosocomial outbreaks, which emphasize early recognition, screening, and vaccination of susceptible staff [4].

Embedding serological assessment before vaccination avoids both unnecessary immunization of already-immune workers and missed opportunities to protect susceptible staff, which is relevant given the wide variation in seroprevalence across occupational groups [4]. Dual documentation in the internal occupational health record and the national vaccination registry supports traceability, continuity of care between services, and reliable data for outbreak response [8,13]. Defining the post-exposure pathway in advance, including the collaborative decision between vaccine and immunoglobulin and the 14-day window for action, helps ensure that prophylaxis is delivered promptly and consistently, in line with current evidence favouring vaccine-based prophylaxis in healthy adults [9,10].

This review has limitations. It describes a single-institution procedure derived from a narrative synthesis of guidelines and selected literature rather than a systematic review, and clinical outcome or seroconversion data are not presented. Vaccination coverage and adherence were not formally measured, and the workflow reflects the local organization of services, so local vaccine availability, pharmacovigilance requirements, and immunoglobulin supply may require adaptation elsewhere. Nonetheless, the framework is readily transferable to other tertiary hospitals and reinforces occupational health best practice [8,13,14].

Conclusion

Hepatitis A remains a relevant occupational hazard for healthcare workers, and recent outbreaks in Europe and Portugal underscore the need for structured prevention. This mini review synthesizes the evidence on occupational risk, vaccine immunogenicity, and post-exposure prophylaxis, and translates it into a guideline-based hepatitis A immunization protocol for a tertiary hospital, with clear responsibilities across the occupational health, emergency, and infectious diseases services. By combining a service-based risk map, serological assessment, standardized pre- and post-exposure pathways, and dual vaccination recording, the protocol supports timely, consistent, and traceable practice. Its implementation can enhance occupational safety, reduce the risk of nosocomial transmission, and standardize vaccination across services. Prospective evaluation of coverage, seroconversion, and adherence would help confirm its effectiveness and support wider adoption.

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