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Guidelines for the Control of Hepatitis A in South Africa

**Compiled by the Epidemiology Unit,
National Institute for Communicable Diseases
of the National Health Laboratory Service**

Acknowledgments

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Disclaimer

This material is intended as a guideline for public health personnel. It has been compiled from information currently available, and although the greatest care has been taken the National Institute for Communicable Diseases of the National Health Laboratory Service do not accept responsibility for errors or omissions. Readers are referred to the reference articles for further information and should always exercise their own professional judgement in confirming and interpreting findings presented in this publication.

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1. Introduction

Hepatitis A is the most common cause of acute viral hepatitis in many parts of the world including South Africa. The virus is endemic in southern Africa however the true burden of disease is unknown. Although infection in childhood is frequently mild, severe disease can occur in certain high risk groups and disease in adults is frequently associated with significant morbidity.¹ Localized and more widespread community and institutional outbreaks occur in South Africa and frequently raise challenges for control given limited resources. In addition South Africa has a unique epidemiological pattern of disease with variation in rates of infection across different socio-economic groups and provinces. This guideline aims to provide information on the disease, the available epidemiological data for South Africa and the methods available for control in order to empower communicable disease personnel to make informed decisions regarding appropriate and cost effective interventions.

2. Hepatitis A virus (HAV)

Hepatitis A is a small, non-enveloped, single stranded RNA virus and is a member of the family *Picornaviridae* belonging to the genus *Hepatovirus*. The hepatitis A virus (HAV) is transmitted primarily via the faecal-oral route and is frequently referred to as “infectious hepatitis”.² Human HAV has only one serotype but can be grouped into 4 human genotypes (I, II, III, VII) using RNA sequencing. The virus may persist in the environment for prolonged periods even under high levels of environmental stress but is inactivated by boiling (at >85 °C for 1 minute) and on exposure to household bleach (1:100 dilution in tap water).³

3. Global Epidemiology of hepatitis A

Outbreaks of hepatitis A have been described for centuries. Person to person spread is the most common method of transmission via the faecal-oral route. However infection may also result from exposure to a common vehicle such as faecally contaminated food or water.⁴ Transmission via blood products has been described but is infrequent. There is however increasing evidence that the viraemic phase of the illness is much longer than previously thought and adult patients may be viraemic for up to 30 days prior to the onset of symptoms.⁵ Infection is also transmitted through anal-oral sexual contact. Although the virus can be detected in saliva there is no evidence for transmission via this route.⁴

The incubation period for HAV is 15 - 50 days (average = 28 days). Individuals are most infectious two weeks prior to the onset of jaundice and infectivity then begins to fall. Most individuals will remain infectious for 1-2 weeks following the onset of jaundice.¹ However, prolonged shedding of the virus in stool has been documented thus increasing the period of infectivity.⁶ There is no chronic carrier state as is seen in Hepatitis B and C infection. In many cases, particularly in children, infection is asymptomatic and opportunities for early identification and prevention of secondary spread of disease are limited. Immunity following infection is considered to be life-long. In areas where exposure to HAV in childhood is less likely due to improved living conditions, infection will occur less frequently but will present in adults and is more likely to be symptomatic. Thus morbidity associated with disease in this setting is considerably greater.

Considering the above features, the epidemiology and clinical presentation in an area is largely influenced by the age at which individuals become infected. In areas where socioeconomic standards are poor and there is inadequate access to clean water and sanitation, infection occurs early in life and produces mostly mild or asymptomatic disease. In these areas rates of infection are higher but morbidity considerably less. Most people in such communities are immune by adolescence and this immunity persists lifelong. In developing countries most children are infected before age 9 years.³

The global epidemiology of hepatitis A has changed markedly due to improvements in water supply, sanitation and hygiene. In highly industrialised countries prevalence in blood donors is now <10% and cases are largely imported by individuals visiting endemic areas.³

As endemicity patterns shift from high to intermediate levels a larger pool of susceptible older children and adults develops and symptomatic disease with increased morbidity and mortality as well as outbreaks are more frequent.

Some groups of individuals are considered to be at higher risk for hepatitis A infection. These include:

- Persons living in regions with endemic hepatitis A (most of South Africa).
- People who are household/sexual contacts of infected individuals – the secondary attack rate for symptomatic disease in these individuals is 20-50%.
- Health care workers.
- International travellers from non-endemic to endemic regions ie: travellers into South Africa from non-endemic areas.
- Preschool children attending day-care centres, their parents and siblings.
- Refugees residing in temporary camps following catastrophes or displacement.
- Individuals with chronic liver disease.
- Food handlers.
- Employees of day-care centres.
- Residents and staff of closed communities (institutions) particularly in those where personal hygiene in residents is compromised, residents are incontinent or wear nappies.

4. Epidemiology of hepatitis A in South Africa

There is a paucity of data regarding true incidence of hepatitis A in South Africa. Cases of hepatitis A infection are significantly under-reported and reflect only those individuals with symptomatic disease. A total of only 1612 cases of hepatitis A infection were notified to the national Department of Health from January 2001 to December 2005.⁷

In 1994 a small seroprevalence study found 90% percent of black South African adults and 40-60% of white South African adults were positive for hepatitis A virus-specific IgG. Lower rates of 11-27% were found in health care workers and medical students.⁸ The most recent published serological survey in South Africa was conducted in 1998/9. Fifty percent of children from lower socio-economic communities were seropositive by age 5-7 years and 80% by 11-13 years. By contrast, the majority of individuals in higher socio-economic groups were seronegative by age 11-13 years (76%).^{9,10}

There are several challenges in defining the true prevalence of infection in SA. A significant underestimation of hepatitis A cases is likely as infection in young children is mostly asymptomatic and compliance with passive notification is poor. As sanitation conditions improve in SA infection is likely to shift to older age groups and an increase in the incidence of symptomatic disease may occur. This could potentially result in increases in morbidity and socio-economic losses.

5. Clinical features of hepatitis A infection

5.1 Typical clinical features

Hepatitis A infection is usually a self limiting disease. However the clinical presentation may vary and is influenced by factors such as age and the presence of underlying risk factors for severe disease.

In children infection is most often asymptomatic. Most children under age 4 do not become jaundiced. In those age 4-6 years, the majority are anicteric (90%). In individuals > 15 years of age 40-70% present with jaundice.⁴

Several clinical presentations are recognized and include:

- Asymptomatic infection – most children
- Symptomatic hepatitis with jaundice (40-80%)
- Symptomatic hepatitis without jaundice
- Fulminant hepatitis with acute liver failure

- Cholestatic hepatitis
- Relapsing hepatitis

In 85% of individuals who develop jaundice this is preceded by sudden onset of a prodromic illness characterized by non-specific symptoms including one or more of the following:

- loss of appetite
- fatigue/malaise
- diarrhoea
- abdominal pain
- nausea and vomiting
- fever
- arthralgia and myalgia
- flu-like symptoms – cough, coryza, pharyngitis, photophobia and headache

The symptoms of the prodrome usually decline with the onset of jaundice. Patients with jaundice usually have dark urine and may experience pruritis. A consistent feature of infection with hepatitis A (with or without jaundice) is the presence of raised hepatic transaminases (500-5000 U/L). Rare extrahepatic presentations including mononeuritis multiplex, cutaneous necrotizing vasculitis, cardiac abnormalities, Guillane-Barré syndrome, transverse myelitis and aplastic anaemia have been described. Mortality rates for hepatitis A infection are generally low (0.2% of icteric cases) but increases significantly in patients with chronic hepatitis B or C or underlying liver disease.⁴

5.2 Fulminant hepatitis A

This is a rare complication of hepatitis A infection. It follows extensive necrosis of the liver and occurs during the first 6 to 8 weeks of illness. The condition is heralded by the onset of high fever, severe abdominal pain, vomiting, jaundice and the development of hepatic encephalopathy with associated coma and seizures. Mortality rates are 70-95% unless liver transplantation is performed where 65% survival rates have been achieved. Rates of fulminant hepatitis A and mortality increase with age and almost 100% of those > 50 years of age can be expected to die.^{1,4}

5.3 Relapsing hepatitis A

This is uncommon occurring in 3 - 20% of patients. It may occur 4 to 15 weeks after the initial symptoms have resolved. Illness manifests with a relapse of symptoms and liver function abnormalities. In addition, HAV is shed in the stool and patients are again infectious. The vast majority of patients will recover fully. There is no chronic carrier state in hepatitis A infection.^{1,4}

5.4 Cholestatic hepatitis

Another uncommon presentation of hepatitis A infection is the development of cholestatic jaundice characterized by persistent symptoms and raised bilirubin levels for several months with or without pruritis. Most individuals will recover.^{1,4}

6. Diagnosis of hepatitis A

The causes of viral hepatitis cannot be distinguished clinically. A single serum sample (5ml clotted blood) for hepatitis A (anti-HAV IgM), acute hepatitis B and C should be requested. Additional diagnostics tests for other causes will be required depending on the history and clinical presentation of the patient.²

At the time of presentation almost all patients will be positive for hepatitis A virus-specific IgM (anti-HAV IgM). Most will also have anti-HAV IgG at initial presentation. The latter will persist long term and provide lifelong immunity. Anti-HAV IgM levels decline over 3-6 months following infection. The presence of antibodies is usually accompanied by a decline in viraemia and viral shedding and hence infectivity. The use of pooled immunoglobulin does not influence the results of serological tests as the

levels achieved, although protective, are below the limit of detection in standard tests. In addition hepatitis A vaccine is unlikely to produce a measurable anti-HAV IgM response.²

Techniques for direct antigen detection in blood and faeces are available but are primarily used in research settings and are not recommended for routine diagnostics. Molecular epidemiology of hepatitis A can be performed by reference laboratories when required such as confirmation of a common source outbreak.^{2,6}

7. Options for control of hepatitis A

7.1 General control measures

There are several available options for control of hepatitis A. The choice of response will be dictated by the specific situation. Factors for consideration include:

- the nature of the intervention (pre-exposure or post-exposure)
- the nature of cases i.e: sporadic vs. outbreak
- the location of a case i.e: community vs closed institution
- the presence of risk factors for severe disease in the household/sexual contacts of cases
- the time since infection and exposure or time to exposure (in the case of travel)
- the cost effectiveness of the planned intervention
- the nature of transmission e.g.: common source vs. propagated outbreaks

Primary prevention should always be emphasized and includes the provision of adequate sanitation, promotion of good hand hygiene and access to safe food and water for all individuals in South Africa. Regular inspection of food establishments and compliance with safe food handling practice should be reinforced. In addition adherence to adequate infection control measures in health care facilities and institutions must be promoted. Hospitalised cases do not usually require isolation unless they are faecally incontinent. Strict adherence to standard and contact precautions should be sufficient to prevent spread of infection in health care facilities.

7.2 Specific control measures

7.2.1 Pooled intramuscular immunoglobulin (normal human immunoglobulin for intramuscular use NHIG)

Pooled intramuscular immunoglobulin can be used to provide **passive immunity** to hepatitis A (Table 1). This strategy has been in use for over 50 years and has been shown to be effective in both pre and post- exposure when administered correctly.^{1,3,4} The products are prepared from pooled immunoglobulin and are therefore influenced by the seroprevalence of hepatitis A in the plasma donors.¹¹ As living conditions improve and levels of endemic hepatitis A decline, antibody levels from donors may be sub-optimal. Intravenous preparations of immunoglobulin are not recommended for this use.

In South Africa the available HNIG products for intramuscular use include¹¹:

- Intragam® - preferred product, locally produced and more readily available.
- Beriglobin® - produced overseas and hepatitis A antibody levels may be lower than the South African product.

Note: NHIG is safe for use in pregnancy when clearly indicated.

Table 1. **Use of pooled intramuscular immunoglobulin (NHIG) in hepatitis A control**

HNIG use in hepatitis A control		
Indications	Recommended dosage	Disadvantages
<p>Pre-exposure prophylaxis:</p> <ul style="list-style-type: none"> ▪ For travellers from non-endemic to endemic areas/ travellers at high risk of severe disease who have insufficient time to respond to vaccine i.e: travelling within 4 weeks of seeking advice. ▪ For children < 1 year in whom protection is required (current vaccines are not licensed for children <1 year) 	<p>0.02ml/kg IM* (for stays <3 months) Wherever possible individuals requiring longer term protection should receive hepatitis A vaccine at the same time as immunoglobulin. Antibodies to vaccine develop fully by 4 weeks (see Hepatitis A vaccine).</p>	<p>Short term protection (3 months)</p> <p>Efficacy depends on level of antibody amongst donors</p> <p>Painful injection</p> <p>Cost</p>
<p>Post – exposure prophylaxis: (see Table 3.)</p>	<p>0.02 – 0.04ml/kg IM*</p>	<p>Must be given early – within 14 days, preferably within 72 hrs of exposure. Efficacy is reduced with time since exposure. Administration up to 4 weeks may reduce disease severity in high risk contacts. (Table 3.)</p>

* Administered into deltoid muscle or gluteus. Given subcutaneously in haemophiliacs

7.2.2 Hepatitis A vaccines

The availability of HAV vaccine has provided a very valuable method of control of hepatitis A particularly for pre-exposure prophylaxis. Four vaccines are available globally, three of which are available in SA. They are formalin inactivated and are cultivated on human diploid cells. There are currently 2 single products and 1 combination product available in SA [Table 2].¹¹

Hepatitis A vaccine is the method of choice for pre-exposure prophylaxis. A primary course for pre-exposure prophylaxis is a single dose with a booster at 6-12 months. Estimated efficacy after these 2 doses is 95%. The vaccine has been used in post-exposure prophylaxis but is not registered for this purpose. Its use in this setting is limited as it must be administered within 7 days of exposure and data on its efficacy is variable. The vaccine is highly immunogenic and almost 100% of adults will develop protective levels of antibody after 4 weeks. Following a booster dose at 6-12 months protection is prolonged and is likely to provide protection for many years if not lifelong.^{2,12,13}

7.2.2.1 Special considerations for vaccine use

Pregnancy: should be used only where clearly indicated.

Infants: the vaccine is not licensed for use in children < 1 year.

Immunosuppressed individuals (including HIV): this is an inactivated vaccine and is therefore safe for use. Responses to the vaccine may be reduced in advanced immunosuppression including HIV.

Table 2. **Hepatitis A vaccines in South Africa**¹¹

Hepatitis A vaccines in SA*				
Trade Name	Manufacturer	Contents	Dose*	Schedule
HAVRIX 1440®	GlaxoSmithKline	1440ELISA units/ml	1ml (adults)	Single primary dose. Booster at 6-12 months.
HAVRIX junior®	GlaxoSmithKline	720ELISA units/0.5ml	0.5ml (children 1Y-16Y)	Single primary dose. Booster at 6-12 months
AVAXIM® 160	Sanofi Pasteur	160 antigen units/0.5ml	0.5ml (adults and children ≥ 2Y)**	Single primary dose. Booster 6months later for age 2-17 years, 6-12 months for adults.
AVAXIM 80® (paediatric)	Sanofi Pastuer	80 antigen units/0.5ml	0.5ml (1Y-15Y)	Single primary dose. Booster at 6 months
TWINRIX® † (combined HepA and HepB)	GlaxoSmithKline	HepA 720EU and HepB 20mcg/ml	Adults (≥18Y) - 1ml.	Repeat at 4 weeks and at 6 months to complete 3 doses.

* always given into the deltoid muscle NOT gluteus

** licensed for use from age 2 years only

† licensed for adults only

7.2.2.2 Immunisation for travellers

Individuals travelling from low risk to high risk environments for hepatitis A infection should be offered vaccine in addition to general advice on prevention (Appendix A). For maximum efficacy travellers should be immunized 4 weeks prior to departure. For travellers departing before 4 weeks, immunoglobulin can be given to offer immediate protection (for up to 3 months) as well as HAV vaccine if long term protection is required (Table 1.). Children < 5 years have a low risk for symptomatic disease if infected and the use of vaccine for these travellers is an individual choice. Prevention of infection in these children may however protect their adult contacts. Education on good hand hygiene should always be included.^{3,13}

7.2.2.3 Other indications for use of hepatitis A vaccine in SA

a) High - risk groups

Hepatitis A vaccine can be considered as pre-exposure prophylaxis in individuals who are at high risk for acquisition of hepatitis A or at risk for more severe disease. This includes:

- individuals with chronic hepatitis B or C infection
- individuals with liver cirrhosis
- haemophiliacs
- intravenous drug users
- raw sewage workers

b) Institutional staff and residents

Hepatitis A vaccine should be considered prior to admission for institutions in which residents are incontinent and/or have limited ability to maintain good personal hygiene and where background rates of hepatitis A in their communities of origin are low to intermediate. In addition carers and health care workers in such institutions should also be considered for pre-exposure vaccination. In SA many adults are likely to be immune and it may be cost effective to screen these individuals prior to vaccination. Recent institutional outbreaks in SA showed a seropositivity of ≥ 90% amongst staff who were screened (personal communication NICD).

c) Children's homes for HIV infected/exposed children

Homes caring for HIV infected/exposed children should consider vaccination against hepatitis A and B for all non-immune staff and volunteers and children on antiretroviral treatment (ART). Although hepatitis A infection is frequently asymptomatic in young children, raised hepatic transaminases in asymptomatic children on ART may necessitate withdrawal of ART which can be avoided if infection is prevented. The primary means of prevention of infection in this setting is good infection control practice and emphasis on hand hygiene. Recent outbreaks in HIV children's homes in Gauteng have highlighted the need for reinforcement of basic infection control measures (personal communication NICD).

d) The role of hepatitis vaccine in reduction of disease incidence

The role of routine hepatitis A vaccine use in reducing disease incidence depends on the epidemiological patterns of disease. In countries with high rates of endemic disease, infection usually occurs in childhood and is thus associated with little morbidity and mortality. Vaccination programs in such settings are of little value. Vaccine has been used successfully in countries with little endemic disease that have specific communities with a high risk of infection. In such countries such as the USA, targeted routine vaccination in these communities has significantly reduced disease incidence. Countries with intermediate endemicity may reduce disease incidence through use of widespread vaccination programs.^{3,12} Although there is currently no national vaccination program for hepatitis A in South Africa, individuals may choose to be immunized for their personal protection.

e) The role of hepatitis A vaccine in outbreak control

Hepatitis A vaccine had been used in outbreaks in various settings with varying efficacy. In general it has no role to play in a common source outbreak as the time since exposure would be a minimum of 15 days once the first case is identified. Community wide outbreaks have been controlled with use of hepatitis A vaccine where the target population was easily defined and high coverage achieved. Paediatric vaccination programs in high risk communities in the USA have also been used to control outbreaks.^{3,12,13}

Successful use of vaccine in outbreak control will depend on the nature of the outbreak, whether the target community can be well defined and coverage rates of at least 70% in the target population can be achieved. There is little data at present to support the use of vaccine alone in crèches/day care centres or institutions and aggressive use of immunoglobulin still remains the mainstay of control in such situations.^{3,12,13}

8. Guidelines for control in specific situations in SA

Remember: Hepatitis A is a notifiable condition in SA

8.1 Response to a single sporadic case

8.1.2 General measures

- a) **Confirm the diagnosis** - obtain a copy of the laboratory report and confirm the laboratory evidence of acute hepatitis A infection i.e.: hepatitis A IgM positive on serum (blood).

**Remember: You cannot distinguish causes of viral hepatitis clinically.
Remember: Viral hepatitis is not the only disease that causes acute jaundice. Other life-threatening causes of acute jaundice such as malaria must be considered especially in travellers to malaria endemic areas.**

- b) **Management of the case** - there is no effective antiviral treatment for hepatitis A infection and treatment is supportive. Hospitalised cases do not usually require isolation unless they are faecally incontinent. Adherence to standard and contact precautions should be sufficient to prevent spread of infection in health care facilities. Sanitary disposal of faecal waste and strict hand hygiene should be emphasised.
- c) **Obtain details on the case including:**
- a. Full name, age, gender.
 - b. Details of place of residence and work including any institutional contact, crèche/daycare attendance and school.
 - c. Date of onset of illness – obtain information on the date of first symptoms if possible and/or date of onset of jaundice.
 - d. Possible risk factors for infection e.g.: travel, food and water sources, contact with a case, other risk exposures/occupations.
- d) **Identify and list details of household, “household-like” contacts of the case. These contacts usually include:**
- i. Household and sexual contacts.
 - ii. Children and staff in crèche/daycare settings
 - iii. Contacts of cases in institutions where hygiene is likely to be poor such as homes for the mentally or physically disabled or where individuals are in nappies or are incontinent.
 - iv. Other contacts may require prophylaxis depending on the nature of contact e.g.: health care workers who were exposed to faecal material without proper infection control measures.
- e) **Consider administration of appropriate post-exposure prophylaxis to non-immune** household and “household-like contacts” (see above) preferably within 72 hours and up to 14 days of contact (Table 3).**
- i. Pooled immunoglobulin (refer table 1 for dosage) should be considered for household, “household-like” and sexual contacts (as identified above).
 - ii. If immunoglobulin cannot be administered to all such contacts, preference should be given to the following:
 - Crèche/daycare contacts including staff as outbreaks in this setting are common.

- Contacts of cases in institutions where hygiene is likely to be poor such as homes for the mentally or physically disabled or where individuals are in nappies or are incontinent. In this case, only those likely to have had potential contact with infected faecal material should be targeted. This usually includes non-immune staff (including support/cleaning staff) and those sharing the same dormitory and/or communal activities.
- Individuals at high risk of severe disease
 - i. Individuals with chronic hepatitis B or C, history of excessive alcohol use, cirrhosis or hepatic carcinoma
 - ii. Age >50years
- Individuals receiving antiretroviral therapy

** Available data from South Africa suggests many adolescents and adults are likely to be immune to hepatitis A through childhood exposure. However, routine testing for hepatitis A IgG (to determine immunity) in such household contacts following a single case is not likely to be cost effective and may result in delays in administration of immunoglobulin that will reduce the efficacy of the intervention. In institutional settings where large numbers of potential staff and residents may require post-exposure prophylaxis it may be more cost effective to screen adolescent and adults contacts first. Such requests should be communicated directly with the laboratory to ensure that testing is expedited. Testing for evidence of immunity in children prior to administration of immunoglobulin is less likely to be cost effective and results in unnecessary delays.

f) Provide education to patient and contacts regarding basic hygiene measures to prevent transmission

Individuals should be informed that faecal oral transmission can be prevented by scrupulous attention to hand hygiene after using the toilet and before handling food.

g) Investigate for a possible source of infection

In most instances of single community based cases the source of the infection will not be determined. However notification of a case is an opportunity to review hygiene and food preparation in households, sanitation and water supply and to establish any possible contaminated food or water source. If a possible common source contamination is likely active surveillance for other cases may need to be introduced.

h) Identify any links to other cases or evidence of a community/institution based outbreak:

- i. Regularly review the trends in number of cases and incidence rates for hepatitis A for the province, district and sub-district. Notification and laboratory data should be used to ensure more accurate case numbers.
- ii. Review the reported cases of hepatitis A for the last 3 months and look for:
 - Common geographical areas that may suggest a common source e.g.: water
 - Common institutions
 - Common families or extended families
 - Common exposures e.g.: restaurants, fast food outlets, water sources
- iii. Conduct active surveillance following cases in institutions/crèches/daycare for at least 2 months following a single index case.

Table 3. Options for post-exposure prophylaxis for hepatitis A

Options for post-exposure prophylaxis hepatitis A – for household, “household-like” and sexual contacts of sporadic cases

≤ 14 days since exposure	15 - 27 days since exposure	≥ 28 days since exposure
Give pooled immunoglobulin (Beriglobin® or Intragam®)	Consider giving pooled immunoglobulin in high risk contacts: underlying liver disease * immunocompromised patients	Unlikely to benefit from specific intervention. Reinforce prevention measures and early referral if illness develops. Remind exposed contacts that disease may develop up to 50 days after exposure

NOTE: Consider hepatitis A vaccine in addition to immunoglobulin for long term protection. Hepatitis A vaccine alone is not currently licensed for use as post-exposure prophylaxis.

* Individuals with chronic hepatitis B or C, history of excessive alcohol use, cirrhosis, hepatic carcinoma. Although infection will not be prevented, disease severity may be modified up to 4 week post-exposure with use of pooled immunoglobulin.

Remember: cases are most infectious BEFORE the onset of jaundice i.e.: during the prodromal phase.

8.1.3 Response to a single case in a school, hospital, work setting

Immunoglobulin is not usually indicated for casual contacts following a single case in these settings where the individual has acquired infection outside the school or work environment unless they meet the criteria for household, “household-like” or sexual contacts”.

8.1.4 Response to a single case in a childcare/crèche setting

Immunoglobulin should be considered for all non-immune staff and children in this setting in the following circumstances:

- following a single case in a child or staff member
- if cases of hepatitis A have been identified in 2 or more households of daycare attendees

If the centre does not care for children in nappies, immunoglobulin may be given to contacts of the case in the same classroom only.

8.2 Response to an outbreak of hepatitis A (≥ 2 epidemiologically linked cases)

8.2.1 General considerations

The response to an outbreak will depend on a number of factors. These include:

- the site of the outbreak
- the likely source of the outbreak i.e.: person to person vs. common source
- the affected population
- availability of resources
- the time since identification of the last case

Such outbreaks require urgent investigation. Good descriptive epidemiology is essential in formulating hypotheses about the outbreak source. This should include careful documentation of cases by person, place and time. A line list should be used to record essential information and an epidemic curve should be constructed.

All hepatitis A outbreaks should prompt a thorough environmental assessment including inspection of food preparation and common food sources, water quality and general hygiene. If a common source outbreak is suspected and the source is unknown further analytical epidemiology may be required to determine the potential source.

8.2.2 Common source outbreaks

A common source outbreak should be suspected if ≥ 2 epidemiologically linked cases occur within one incubation period of each other (on average 28 days for hepatitis A). Epidemiologically linked cases occurring within 15 days of each other are very likely linked to a common exposure. Individuals exposed at the same time to a common source will not benefit from immunoglobulin as a minimum of 15 days would have elapsed from exposure to identification of the first case. However further person to person spread can be prevented through general hygiene education and offering prophylaxis to household/ "household-like" contacts of identified cases as indicated (see "Response to single sporadic case"). If exposure to the source is ongoing, such exposed individuals may benefit from post-exposure prophylaxis.

8.2.3 Outbreaks in child care facilities/crèche/day-care

Aggressive use of immunoglobulin in such settings may prevent further cases and should be provided to non-immune staff and children if within 14 days of the last identified case. If > 14 days, further secondary cases are unlikely to be prevented and active surveillance for new cases should be introduced. High risk individuals may still benefit from immunoglobulin up to 4 weeks post-exposure (Table 3).

8.2.4 Outbreaks in closed institutions

Closed institutions, in particular those in which individuals are unable to maintain personal hygiene, are incontinent or in nappies, are at risk for spread of infection.

Aggressive use of immunoglobulin in such settings amongst individuals who are part of the exposed group may prevent further cases and should be provided to non-immune staff and children if within 14 days of the last identified case. If > 14 days, further secondary cases are unlikely to be prevented and active surveillance for new cases should be introduced. High risk individuals may still benefit from immunoglobulin up to 4 weeks post-exposure (Table 3). In such settings screening of adolescents and staff for hepatitis A immunity (hepatitis A IgG) may be cost effective prior to widespread use of immunoglobulin. However, it is essential that results are obtained rapidly to avoid unnecessary delays in the intervention. In addition to immunoglobulin use, such institutions should consider hepatitis A vaccination of non-immune staff and residents to ensure long term protection.

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