HEPATITIS A ASSOCIATED WITH A CHILD-CARE CENTRE

Graham Tallis[1], *Mark Veitch*[2] *and Bronwen Harries*[1]

Abstract

The Infectious Diseases Unit of the Victorian Department of Health and Community Services was notified in October 1995 that two staff members of a child-care centre had recently been ill with hepatitis A. Two more cases associated with the centre were promptly recognised. Investigations revealed four further cases associated with the centre over the preceding six weeks. After intervention with normal human immunoglobulin there was only one further case.

For early intervention to limit outbreaks of hepatitis A related to child-care centres, cases must be promptly reported to health authorities.

Background

At least 15% of notified cases of hepatitis A in the United States are associated with child-care centres[1]. Similar data on sporadic cases are not available for Australia, but outbreaks related to child-care centres have been reported recently[2]. Hepatitis A is a notifiable disease in all Australian States and Territories.

Infants with hepatitis A have few specific symptoms[3], and the diagnosis may be missed in this age group. These nappy-wearing children pose a substantial risk to fellow child-care centre attenders, their families and centre staff. Various guidelines for the management of outbreaks related to child-care centres have recently been promulgated, emphasising the role of hygiene, the use of immunoglobulin and active vaccination of staff [3,4,5].

On 11 October 1995, the Infectious Diseases Unit of the Department of Health and Community Services, Victoria, was asked by the coordinator of a child-care centre in suburban Melbourne how to respond to two staff members who had been diagnosed with hepatitis A in the previous two weeks. The centre has 46 child-care places and employs 13 staff. It is located in two adjacent houses, one for infants and toddlers up to two years old, the other for pre-school age children aged three to five years.

Methods and Interventions

In response to the notification we advised the coordinator of the centre to notify parents of all attending children that there had been cases of hepatitis A connected with the centre. An information sheet and letter advised parents to seek normal human immunoglobulin (NHIG) for children attending the centre from their local doctors. We advised staff to seek NHIG. We inspected hygiene and food handling at the centre and suggested improvements.

We investigated possible cases of hepatitis through their general practitioners and maintained surveillance for cases associated with the centre by questioning cases of hepatitis A notified to the Infectious Diseases Unit in the ensuing months.

We defined a case of hepatitis A associated with the centre as:

- a centre attender, staff member or household contact of an attender with serological evidence of recent hepatitis A infection (the presence of anti-HAV IgM),

  or

- jaundice and household contact with another confirmed case, between 1 August and 31 December 1995.

When it was clear that the outbreak involved at least four cases stretching back six weeks we sent a second letter to parents of children in the infant-toddler group advising them to seek NHIG for themselves and other household members. We conducted an immunisation session for families and children at the centre who had not yet received NHIG from their local doctors at which 30 doses of NHIG were administered.

Results of Case Finding and Surveillance

Nine cases of hepatitis A were identified, including three staff members, five parents and one sibling of a child in the infant-toddler group at the centre (Table). Onset of illness was between September and December 1995 (Figure). There were no clinical cases of hepatitis A recognised in children at the centre.

One of the affected staff members (case 6) worked in the infant-toddler group house and also had a child in this group. The other staff member (case 3) worked in the pre-school group house and her own child attended the infant-toddler group.

The day after we sent information to parents, we learned of two more cases of hepatitis associated with the infant-toddler group. One (case 4) was the father of a child in the infant-toddler group, the other (case 7) was a child of an affected staff member (case 6) and the sibling of a child who attended the infant-toddler

1. Infectious Diseases Unit, Department of Health and Community Services, GPO Box 4057, Melbourne, Victoria 3001.

2. Microbiological Diagnostic Unit, Department of Microbiology, University of Melbourne, Victoria.

Table. Details of cases of hepatitis A associated with a child centre, Victoria, 1995

Number	Age and sex	Jaundice	Confirmed anti-HAV IgM positive	Link to 0-2 years group house
1	26 F	Yes	Yes	Child care worker in 0-2 years group
2	31 F	No	Yes	Parent
3	30 F	Yes	Yes	Parent of attender in 0-2 years group and child care worker in 3-5 years group
4	43 M	Yes	Yes	Parent
5	29 M	Yes	Yes	Parent
6	33 F	Yes	Yes	Parent of attender and child care worker in 0-2 years group
7	5 M	Yes	Not tested	Older child of case 6, sibling in 0-2 years group
8	36 M	Yes	Yes	Parent

group. In subsequent weeks, we identified three more parents of children in the infant-toddler group as recent cases of hepatitis A (cases 2, 5 and 8).

A third staff member (case 1) in the infant-toddler group house reported an illness comprising nausea, vomiting and fever which was diagnosed as gastroenteritis in late August. After returning to work for one day she again fell ill and noticed a yellow tinge to her sclera. She remained away from work for the rest of September. Serology in October confirmed recent hepatitis A infection.

The most recent case (case 9) is a parent of a child in the infant-toddler group. Her child received NHIG in October but she did not.

Discussion

Control of hepatitis A associated with child-care centres involves recognising cases associated with the centre, scrupulous hygiene and administering NHIG to appropriate contacts. The possible role of active vaccination with hepatitis A vaccine should also be considered.

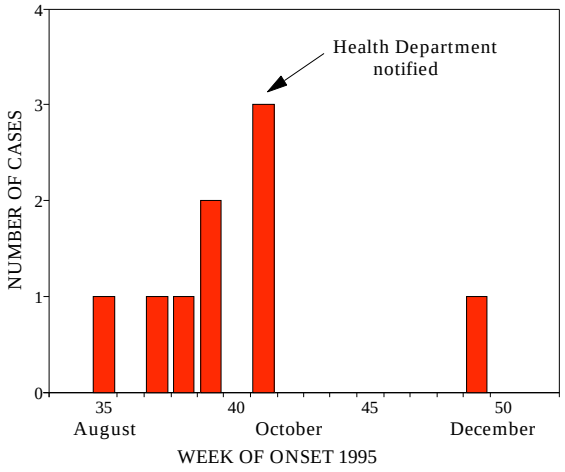
Recognition

Medical practitioners need to be alert to the possibility of a 'silent' outbreak of hepatitis A among small children in a child-care centre when parents or siblings of such children, or staff of a centre, present with hepatitis A.

Unless cases of hepatitis A associated with child-care centres are reported promptly to public health authorities, clusters of cases will not be recognised and the opportunity to intervene effectively may be lost. The long incubation period of up to 50 days[4] further complicates the recognition and control of outbreaks.

In this outbreak there had been at least six cases of hepatitis associated with the centre (over six weeks) before the Infectious Diseases Unit was notified. Two further cases presented within three days. Hence, at the time of notification, eight of the nine cases were already

Figure. Onset of cases of hepatitis A associated with a child-care centre, Victoria, 1995



ill or infected and were not preventable by any actions at that time. We suspect that hepatitis A infection was occurring in the children in the infant-toddler group some weeks prior to the first adult case on 30 August and continued until mid to late October.

We chose not to seek blood samples from infants at the centre because by the time the Unit became involved there was substantial epidemiologic evidence implicating this group as the source of infection. Testing of saliva for hepatitis A antibodies has been used to investigate outbreaks of hepatitis A among children[6,7], but is not routinely available. This non-invasive approach might have provided supportive laboratory evidence that hepatitis A was occurring in small children at the centre.

Hygiene

Hygiene was generally satisfactory at the centre, but hepatitis A poses particular problems in this respect as virus may survive for weeks on environmental

fomites[8]. Hand washing facilities must be available and used in nappy changing areas, food preparation areas and toilets. Bathrooms, toys, floors and surfaces in child-care centres must be cleaned daily with warm water and detergent. In an outbreak diluted bleach should be then used for disinfection[9].

Immunoglobulin

The aim of administering NHIG to centre attenders (in conjunction with other measures) is to reduce transmission of infection within and from this group[10]. The aim of administering NHIG to older contacts is to prevent or attenuate illness.

Guidelines for the use of NHIG in cases of hepatitis A related to child-care have recently been published by the American Public Health Association[4], the American Academy of Pediatrics[3], and the National Health and Medical Research Council (NHMRC)[5].

These guidelines recommend fairly limited use of NHIG in response to one or two cases of hepatitis A associated with nappy-wearing children at a child-care centre. The NHMRC recommends NHIG be given to unvaccinated staff if one case occurs in association with a centre and extending its use to centre attenders in contact with cases if two cases occur. The American guidelines recommend use of NHIG for centre attenders and unvaccinated staff for one or two cases associated with a child-care centre. However, when more than two cases related to a centre occur and / or cases occur over more than three weeks, wider use of NHIG may be justified including all family contacts of nappy-wearing centre attenders.

These recommendations recognise the ease with which hepatitis A is spread from nappy-wearing infants in child-care settings, the relative infrequency of clinically apparent hepatitis in infants and the likelihood that recognised cases of hepatitis A associated with child-care centres are tips of a larger iceberg.

Active vaccination

Staff of child-care centres where there are children in nappies should receive inactivated hepatitis A vaccine[5,9]. This could have prevented three cases in this outbreak. The role of hepatitis A vaccine in outbreaks is under investigation. Widespread active immunisation has been used in ongoing community-wide outbreaks of hepatitis A[11,12], but the vaccine is not currently licensed in Australia for use in children aged less than 5 years.

Hepatitis A vaccine (available in some countries in a paediatric dose) may have a role in preventing ongoing transmission in child-care centre outbreaks, provided outbreaks are recognised soon enough to intervene before the majority of infants have been infected. However if the outbreak has spread to the surrounding community, it may be difficult to define and vaccinate the wider population at risk of infection.

Conclusion

In this outbreak, failure to recognise and notify cases of hepatitis A associated with a child-care centre impeded public health action to control the outbreak and reduce illness in contacts. Clinicians should investigate the possibility of a connection with child-care in all cases of hepatitis A.

References

1. Centers for Disease Control. *Hepatitis Surveillance Report Number 54.* Atlanta: United States Department of Health and Human Services, 1992.
2. Hanna J. Hepatitis A in a child day-care centre. *Comm Dis Intell* 1993; 17: 73-74.
3. Peter G [Editor]. *1994 Red Book: Report of the Committee on Infectious Diseases, 23rd edition.* Washington: American Academy of Pediatrics, 1994.
4. Benenson AS [Editor]. *Control of Communicable Diseases Manual, 16th edition.* Washington: American Public Health Association, 1995.
5. National Health and Medical Research Council. *The Australian immunisation procedures handbook, 5th edition.* Canberra: Australian Government Publishing Service, 1994.
6. Stuart JM, Majeed FA, Cartwright KAV, *et al*. Salivary antibody testing in a school outbreak of hepatitis A. *Epidemiol Infect* 1992; 109: 161-166.
7. Public Health Laboratory Service Salmonella Committee. The prevention of human transmission of gastrointestinal infections, infestations, and bacterial intoxications. *Commun Dis Rep 1995*; 5(R11): R157-172.
8. Abad FX, Pinto RM, Bosch A. Survival of enteric viruses on environmental fomites. *Appl Environ Microbiology* 1994; 60: 3704-3710.
9. National Health and Medical Research Council. *Staying Healthy in Child Care.* Canberra: Australian Government Printing Service, 1994.
10. Hadler SC, Erben JJ, Matthews D, *et al.* Effect of immunoglobulin on hepatitis A in day-care centres. *JAMA* 1983; 249: 48-53.
11. Beller M, Krause D. Experience with HavrixTM (hepatitis A vaccine, inactivated) in an outbreak setting. Proceedings of the 6th ICID Meeting, Prague, 26 - 30 April 1994. Prague: International Society for Infectious Diseases, 1994.
12. Prikazsky V, Olear V, Cernoch A et al. Interruption of an outbreak of hepatitis A in two villages by vaccination. *J Med Virology* 1994;44:457-459.