
AN OUTBREAK OF HEPATITIS A IN A CHILD-CARE CENTRE

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Abstract

In September 1995, the Brisbane North/Sunshine Coast Zonal Population Health Unit was advised of two cases of hepatitis A associated with a suburban child-care centre. Normal human immunoglobulin (NHIG) was recommended for all children and staff, and written advice on hygiene precautions was provided. A total of nine cases of hepatitis A, five clinical and four sub-clinical, were diagnosed over a nine-week period in persons associated with the centre. Reluctance by some general practitioners to the use of NHIG and the delay in convening a group meeting of parents to emphasise hygiene measures may have contributed to the outbreak.

Introduction

Hepatitis A infection may cause an illness characterised by fever, influenza-like symptoms, malaise fatigue, anorexia, nausea and abdominal discomfort, dark urine, pale faeces, jaundice and pruritus¹. Infants and children often experience subclinical infection. The reported case-fatality rate is low (less than 1 per 1,000) but higher case-fatality rates have been reported among children under five years of age (1.5 per 1,000). For persons over 50 years of age, the case-fatality rate is more than 27 per 1,000².

In the third week of September 1995, the Zonal Population Health Unit was advised that a staff member and the parent of a child at a child-care centre located in a Brisbane suburb had been diagnosed with hepatitis A the previous day. The following week, a second staff member was similarly diagnosed.

The centre caters for children from six weeks to five years of age who attend from the local area and outer suburbs. Children attending the centre were segregated into four groups: baby, 'toddler', two year old, and kindergarten/preschool. There was minimal contact between these groups. There were 44 children and 13 staff attending the centre at the time of the outbreak.

The aim of the investigation conducted by the Zonal Population Health Unit was to detect all cases of hepatitis A associated with the outbreak, implement disease control measures, and assess parental acceptance of the intervention strategy.

Methods

The case definition used was 'a person associated with the centre who tested positive for hepatitis A IgM in the absence of recent vaccination and who developed jaundice or other clinical signs of hepatitis'.

The subclinical case definition was 'a person associated with the centre who tested positive for hepatitis A IgM in the absence of recent vaccination, and who did not develop any clinical symptoms'.

On the day of notification, the director of the centre was advised of the nature of the disease and the route of transmission. Simultaneously, the director was advised that all children attending the centre should be given NHIG³. A fact sheet about hepatitis A, emphasising strict hygiene measures was provided for all parents on the same day.

On receipt of the first notification, the Zonal Population Health Unit determined that no staff members had previously been vaccinated against hepatitis A. It was therefore recommended that all staff be offered NHIG and/or hepatitis A vaccine. The NHMRC recommends hepatitis A vaccine for child-care workers who care for children under two years of age⁴. At least two studies have indicated the effectiveness of hepatitis A vaccines in preventing hepatitis A infection in ongoing community outbreaks^{5,6}. Its effectiveness for post-exposure prophylaxis is still to be determined.

A public health nurse visited the child-care centre to evaluate hygiene measures a few days after the cases were notified. The director was asked to advise the Zonal Population Health Unit of any subsequent cases.

All cases, and their general practitioners, were interviewed. Enquires were made about personal contacts and other possible cases. When a case was identified, family members were advised to receive NHIG. The outbreak was monitored and advice was provided to the staff, parents and their general practitioners.

A search was made of the Notification of Disease database of the Queensland Health Department, in order to determine whether any other cases associated with the centre had been notified. All cases of hepatitis A that had occurred recently in the Population Health Unit zone in which the child-care centre is located were traced. No related cases were found.

All parents of 'toddlers' (children between the ages of one and two years) were asked to have their children tested for hepatitis A when the outbreak was first detected. In mid-November, parents of the two year old children were advised to have their children tested when public health staff were advised that this group may have shared meals with the 'toddlers'. A total of 11 of the 15 children in these age groups were tested. A meeting attended by about 30 parents was conducted in mid-November to discuss the outbreak.

At the end of the outbreak, a questionnaire was sent to the parents of all children at the centre to determine their response to the advice they had received.

Table 1. The distribution of the clinical & subclinical cases

Category	Total number of persons in group	Numbers tested	Clinical cases	Subclinical cases
Babies	8	0	0	no known cases
Toddlers	5	5	0	2
Two year olds	10	6	0	1
Kindergarten/preschool	21	4	0	no known cases
Staff	13	unknown	2	no known cases
Parents/grandparents	unknown	unknown	3	1
Total			5	4

Results

The distribution of the clinical and subclinical cases among children, staff and parents is shown in Table 1.

Four subclinical cases were detected: two 'toddlers', the mother of a 'toddler', and a 2 year old. There was one family cluster associated with a 'toddler' ('toddler' A) who had a subclinical infection. 'Toddler' A's mother also had a subclinical infection and the father and grandfather had clinical infections.

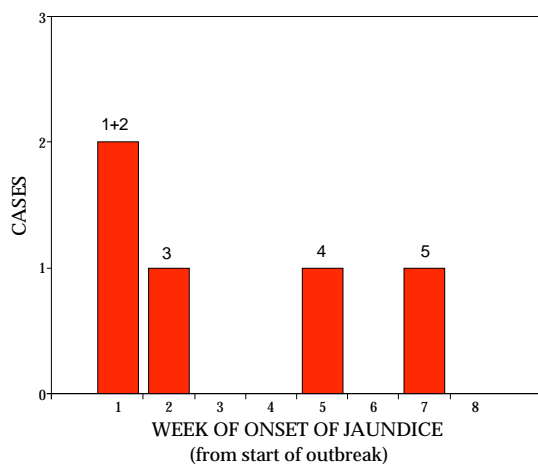
The epidemic curve for clinical cases of hepatitis A is shown in Figure 1.

There have been no new cases identified since November 1995.

Of the 11 non-infected staff, five received NHIG and hepatitis A vaccine, four received NHIG only, and two had hepatitis A vaccine only.

Thirty-five responses to the parental questionnaire out of a possible 44 (80% response rate) were received. Of these, 23 indicated that their children had received NHIG, and 12 had not. Reasons given by the 12 parents

Figure 1. Clinical hepatitis A virus cases associated with the child-care centre, by week of onset of jaundice



Cases 1 and 2. Two adults (one parent and one staff member).

Case 3. One staff member.

Case 4. Grandfather of 'toddler' A.

Case 5. Father of 'toddler' A.

whose children had not received the NHIG included: GP advised against it; worried about NHIG being a blood product; didn't want the child to have a painful injection; thought child was not a risk; and NHIG was too expensive. Several parents gave more than one reason.

Of those responding, 24 (69%) indicated that they had changed family hygiene practices as a result of the outbreak.

Discussion

Case finding was initially conducted in the 'toddler' group, as all adult cases were associated with them. This was extended to the two year old children when it was realised that staff, 'toddlers' and two year olds shared meal times. Active case finding was not conducted in the baby and kindergarten/preschool groups as investigators were confident of the segregation and infection control practices.

The first three clinical cases were all associated with the 'toddler' group and were considered to have been infected from the same source. Case one and case three were staff members at the centre and case two was a parent. We considered that the fourth and fifth clinical cases in weeks five and seven were secondary cases. It was not possible to determine the date of onset for the four subclinical cases or whether they were primary or secondary cases. It was considered that 'toddler A' may have been the index case.

The public health measures instituted included education and distribution of information, improved hygiene, and advising passive immunisation of all children and staff. In addition, there was active immunisation of staff and active case finding of subclinical cases, subsequent passive immunisation of family members. The public health nurse reported that the centre had fully implemented all the hygiene measures recommended by the Zonal Population Health Unit.

The NHMRC immunisation guidelines recommend hepatitis A immunisation for individuals who work in day-care centres, particularly in situations where the children are too young to be toilet trained³. The fact that two staff members had clinical infections supports the

need for implementation of this recommendation in all centres.

NHIG is recommended and has been shown to have proven benefit in preventing or modifying the severity of hepatitis A infection. It must be given within seven to ten days of exposure. The usefulness of NHIG depends on the identification of persons at risk within a few days of exposure.

Many of the parents of the children expressed concern about the use of NHIG, a human blood product, because of fears that it may transmit disease. Several general practitioners expressed similar concerns.

The public health physician discussed with the parents and their general practitioners the low level of risk of receiving NHIG compared with the risks of hepatitis A. As a result, many parents and their general practitioners indicated that the children would have the NHIG. From the questionnaire, it was apparent that 12 children did not receive NHIG.

These results support the findings that infants and children who do not show symptoms of hepatitis A may be a source of infection for others⁷. Most adults develop symptoms, sometimes requiring hospitalisation. To prevent further spread, early intervention may be required, particularly after the first case is identified.

On reflection, a general meeting with all parents should have been convened immediately after the initial cases were identified. Sixty-nine percent of parents reported changes in family hygiene practice as a result of the outbreak. This may indicate that the parents recognised that their current practices were inadequate to prevent transmission of this infection. Early active hygiene education for household members should play an important role in containing such an outbreak.

Measures to be considered in the future include whether to offer NHIG to all children at the centre, and adults associated with them, as in other recently reported outbreaks^{8,9}. Also closer liaison with general practitioners may overcome their reluctance to use NHIG in the prevention of hepatitis A transmission in child-care centres. Should staff at child-care centres be

vaccinated against hepatitis A as part of their employment conditions?

In two subsequent notifications of hepatitis A associated with other child-care centres, extensive liaison with general practitioners regarding the use of NHIG, and early group meetings with parents, appear to have assisted in interrupting transmission in the early stages of the outbreak. In both centres, no secondary cases occurred within the incubation period for hepatitis A.

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