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Outbreak of Hepatitis A – I-Lan County

On June 28, 1985, the Bureau of Disease Control was notified by the I-Lan County Health Bureau of an outbreak of hepatitis A in two aboriginal villages. During May and June, nine probable cases of hepatitis A from these villages were admitted to St. Mary's Hospital near I-Lan City. St. Mary's is a 485-bed private hospital serving all of I-Lan county. All nine cases were less than eight years old and had elevated liver enzymes (SGOT, SGPT), dark urine, scleral icterus, and jaundice. Serum specimens from two of the nine cases were tested by the National Institute of Preventive Medicine and found positive for IgM antibody to hepatitis A virus(HAV). A record review showed the number of hepatitis cases admitted to St. Mary's Hospital from the two aboriginal villages had increased four-fold during May-June compared to the previous four-month period. The number of cases of hepatitis admitted from other areas in I-Lan county had not increased from January 1984 to June 1985.

The two aboriginal villages, Sung-Lo (population 500) and Lumpi (population 410), are located 7 kms apart in the foothills of a tea-growing region approximately 30 kms southwest of I-Lan City. Villagers in Sung-Lo and Lumpi are from the same tribal group and interact frequently. Households in both villages are served by a municipal water supply which serves several other neighboring villages. A few households also use mountain spring water. No large gatherings where food or beverages were served had occurred in either village since March. Neither village has a restaurant. Almost all households in Lumpi village and about half those in Sung-Lo have flush toilets; the remainder have pit latrines. A few households in Sung-Lo use nightsoil for fertilizer.

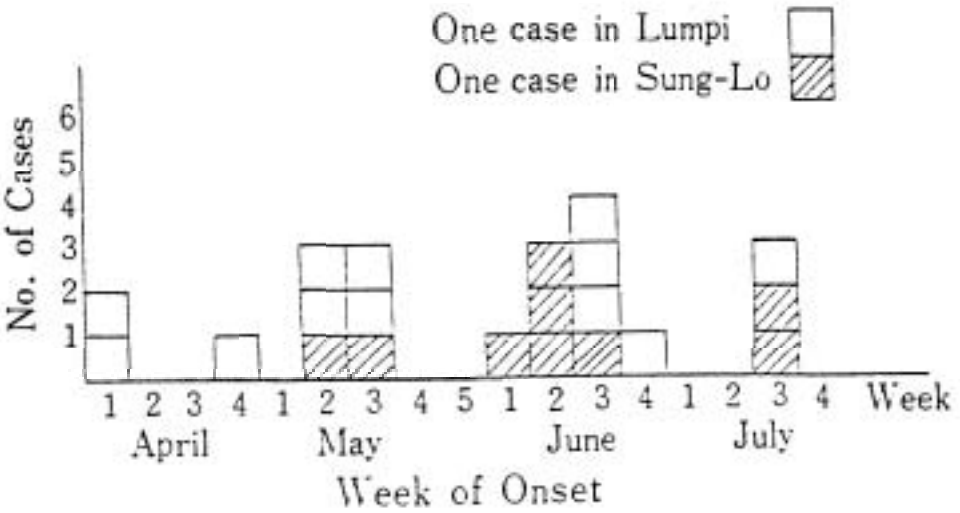
Because young children with HAV infection are often asymptomatic, we conducted a seroprevalence survey in both villages to identify all children ≤14 years of age with IgM antibody to HAV. A total of 258 of 304 (85%) children ≤14 years of age were tested. Forty-six (18%) had IgM antibody indicating recent HAV infection; 165 (64%) were IgM-negative, anti-HAV positive indicating immunity from previous infection; and 47 (18%)

had no antibody. Excluding those with immunity from previous infection, the attack rates were 40% and 60% for Sung-Lo and Lumpi villages, respectively. The mean age of children with IgM antibody was 4 2 years. Twenty-one (46%) were symptomatic. Their dates of onset showed the outbreak probably began in Lumpi village in April and spread to Sung-Lo in May (Figure 1). The epidemic curve suggested person-to-person transmission rather than a common source outbreak.

The first two symptomatic cases in Lumpi village were siblings ages two and four years. The third case was a four year-old next-door neighbor playmate. An asymptomatic sibling of the third case was IgM-positive and attended the Lumpi village kindergarten. The source of infection for the index cases in Lumpi could not be determined; however, both had traveled several times to I-Lan city the month prior to onset. The index case in Sung-Lo village was a five year-old kindergarten attendee who had visited relatives in Lumpi one month prior to onset. During this visit in April, the child played with two children who were IgM-positive asymptomatic cases. In both villages, more than 70% of cases occurred among household or next-door neighbor contacts.

To further identify potential risk factors for the spread of illness, a questionnaire was administered to all IgM antibody positive cases and susceptible controls. Potential risk factors assessed were attendance at a village kindergarten, playing in the nearby river, drinking mountain spring water, or having a playmate who was a case. Case and control households in Sung-Lo village were compared for sewage disposal methods (pit latrine versus flush toilet) and whether nightsoil was used for fertilizer. Attending the village kindergarten was significantly associated with illness in Sung-Lo (12/20 cases compared to 6/30 controls, p=0 006, Fisher's Exact Test), but not Lumpi village (13/26 cases compared to 12/17 controls) In both villages, having a playmate who was a case was also significantly associated with illness (35/46 total cases compared to 16/47 controls, $p<10^{-4}$, x^2). None of the other risk factors studied were associated with illness.

Figure 1. Symptomatic cases of hepatitis A by week of onset in two aboriginal villages, I-Lan County, April-July 1985



Human immune serum globulin (ISG) was administered to all children ≤6 years of age from July 6-9. No new cases of hepatitis were reported in either village after July 17. *Reported by I-Lan County Health Bureau, Taiwan Provincial Health Department, and the Bureau of Disease Control, Department of Health, the Executive Yuan*

Editorial note: This is the third reported outbreak of hepatitis A in Taiwan, and the first since the disease was made reportable in February 1985. In contrast to the two previous outbreaks which involved older children or young adults[1,2], the I-Lan outbreak was limited to pre-school age children, and person-to-person transmission was clearly the most important mode of spread. Although cases tended to cluster among household and neighborhood contacts, the village kindergartens with diaper-age children probably played an important role in disseminating illness among households. Day-care center transmission of hepatitis A is well described in the Unites States, and has become an important public health problem in recent years[3].

The seroprevalence survey showed that hepatitis A is endemic in the two villages; >80% of children over seven years of age had anti-HAV antibody (Figure 2). In contrast, the prevalence of anti-HAV antibody among 1,200 healthy Taipei City children in 1984 was <20% for children 6 months to 14 years of age[4]. A study of Taipei City children 10 years earlier showed significantly higher age-specific prevalence rates for anti-HAV[5]. The relationship between socioeconomic status and prevalence of anti-HAV is well described[6], and probably accounts for these differences. As socioeconomic conditions in Taiwan improve, the prevalence of anti-HAV antibody will decline and the potential for future outbreaks of hepatitis A will increase. For this reason, it is important to improve surveillance for hepatitis A.

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Figure 2. Seroprevalence of anti-HAV in 1,200 Taipei City children, 1984, and in 258 aboriginal children in I-Lan County, 1985