HEPATITIS A VIRUS ANTIBODIES IN MALAYSIAN CYNOMOLOGOUS MONKEYS

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OBJECTIVES :

1. To identify HAV antibody-free cynomologous monkeys for use in HAV challenge studies.

2. To determine if freshly captured cynomologous monkeys have serum antibodies to hepatitis A virus (HAV).

3. To determine if monkeys in captivity develope subclinical infections with HAV.

BACKGROUND : Previously an appreciable prevalence of serum anti-HAV was found in primates in the AFRIMS veterinary medicine facility (1), especially among cynomologous monkeys.

In order to identify and secure additional antibody free monkeys for shipment from USAMRU-KL to AFRIMS to be used in challenge studies, sera from cynomologous monkeys freshly captured in Malaysia late 1979 were sent to AFRIMS for screening for HAV.

METHODS : Serum specimens were obtained from 98 cynomologous monkeys by USAMRU-KL personnel within 30 days of capture by animal dealers during the last 3 months of 1979. Of these 98 animals 28 were purchased by the KL USAMRU lab, housed in the animal caging facility in the Institute of Medical Research (IMR), and rebled on 30 May 1980 (six to eight months after the "capture" blood specimen). Additional sera were obtained from other cynomologous monkeys which had been held in captivity for various periods of time by animal handler L (23 monkeys) animal handler C (10 monkeys) or at the USAMRU-KL (33 monkeys). All sera were screened for anti-HAV undiluted using a commercial blocking radioimmunoassay (HAVAB (R). All sera were tested on the same day, without knowledge of the monkeys weight or captivity history.

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RESULTS : A frequency distribution of the percent blocking among the cynomologous sera tested was found to be clearly biphasic with peak numbers of titers at 0-9% and 90-99+, suggesting that HAVAB test adequately distinguishes between anti-HAV positive and negative cynomologous sera, as it does human sera. The nadir frequency is close to the 50% blocking used as a cut-off value for human sera; therefore 50% was chosen as a cut-off for cynomologous sera.

20 of the 98 (20%) sera obtained from freshly captured monkeys had anti-HAV blocking activity of 50% or greater (mean percent blocking among positives 81 ± 14%). There was a strong association between the weight of a monkey at the time of capture and the probability of a positive assay for anti-HAV (Table 1). The significance of this association is partly clouded by the fact that smaller monkeys were captured and bled on earlier dates than were the larger monkeys, However, even on each bleeding date there was a positive correlation between weight and anti-HAV positivity (see Table 2). Of the 28 monkeys with paired "freshly captured" and 30 May 1980 blood specimens, 26 were sero-negative at the time of capture. Of these 26 monkeys, 25 (96%) converted to sero-positive by 30 May 1980 while in captivity at the IMR.

Among monkeys which had been captive for at least one month (most much longer than one month) when the first blood specimen was obtained for testing for HAV, 57 of 66 were positive for anti-HAV. A high antibody prevalence among captive monkeys was found in all three caging facilities examined (see Table 3).

Table 1. Association of monkey weight and presence of anti-HAV

		Monkey weight (kg)			
		≤ .9	1-1.9	≥ 2.0	Total
% Blocking Anti-HAV	< 50%	19	54	5	78
	≥ 50%	1	9	10	20
	Total	20	63	15	98

$X^2 = 24.1$ P 10^{-5}

Table 2. Prevalence of anti-HAV among cynomologous monkeys : association of monkey weight with anti-HAV on each bleeding date

	Date of "freshly captured" serum specimen				
	1 Oct 79	16 Oct 79	1 Nov 79	6 Nov 79	6 Dec 79
Number of monkeys tested	30	11	21	24	12
Percent positive for anti-HAV	7%	0%	5%	44%	58%
Mean weight (± SD)	1.31 ± .27	1.12 ± .36	0.94 ± .20	1.55 ± .32	4.05 ± .41
Correlation co-efficient (wt vs probability of anti-HAV)	± .269	-	+ .293	+ .097	+ .126

Table 3. Anti-HAV prevalence in freshly captured and long term captive cynomologous monkeys

		Captive >1 month in caging facility of :			
	Freshly captured*	Dealer L	Dealer C	IMR	Total*
Number positive	20	20	7	30	57
Number tested	98	23	10	33	66
% positive	20%	87%	70%	91%	86%

$X^2 = 68.8$; $p < 10^{-9}$