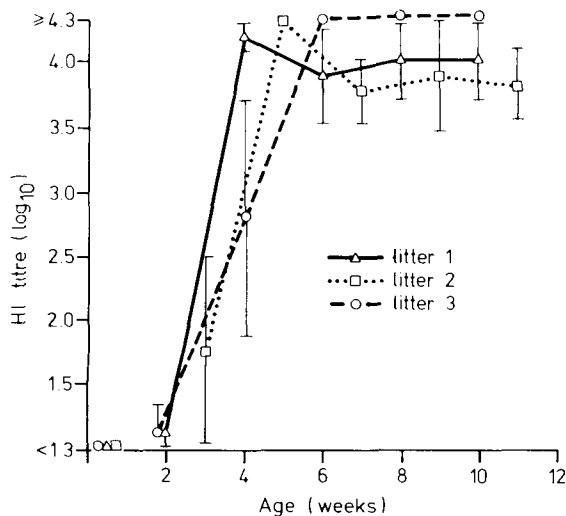


Canine parvovirus infections studied serologically

The puppies were born in or introduced to a kennel where there was serological evidence of widespread canine parvovirus (CPV) infection.

The colony consisted of about 60 dogs of all ages. Dogs were frequently introduced as either bitches with litters, pregnant bitches, or as adult dogs. In addition, 12 to 15 breeding bitches were kept.

Figure 1. Serum haemagglutination inhibition (HI) titres to canine parvovirus in sequential bleedings of litters 1, 2 and 3.



A wide variety of breeds and crossbreeds were involved.

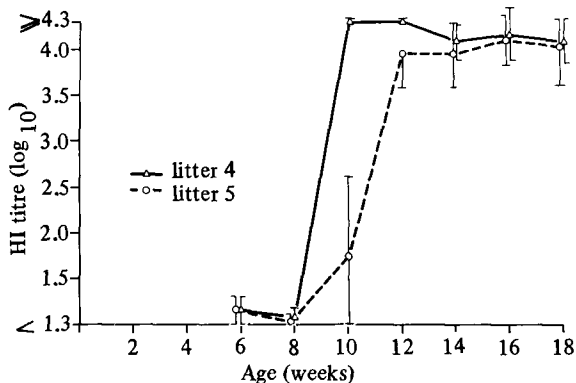
Initially, 24 dogs 6 months and older were bled. Subsequently nine litters of puppies (35 in all) were bled at 2 - 6 weeks of age and then at intervals of 2 weeks. Bitches were bled before whelping where possible. Specific antibody was tested by the haemagglutination inhibition (HI) test.

Nearly all the adult dogs had significant HI antibody titres to CPV. Of the 24 sera tested, 22 demonstrated HI titres of between $10^{3.7}$ (5×120) and $10^{4.3}$ ($\approx 20 \times 480$) and two had titres of $10^{2.5}$ (320) and $10^{2.2}$ (160) respectively. The majority of dogs with HI titres of less than $10^{1.3}$ (< 20) seroconverted to CPV within 30 days of introduction to the breeding colony, indicating that CPV was endemic in the population.

Figures 1-4 show the results of sequential bleedings of the 9 litters. All 35 dogs in litters 1-5 seroconverted to CPV. The majority of CPV infections were subclinical at both 3-5 weeks of age (litters 1-3) and 8-12 weeks of age (litters 4-5). No clinical disease was observed in litters 2, 3, 4, 5, 6, 7 or 8. Subclinical infections by parvoviruses are common in other species¹ and have been suggested to occur with CPV infections of dogs².

continued overleaf

Figure 2. Sequential haemagglutination inhibition (HI) titres to canine parvovirus in sequential bleedings of litters 4 and 5.



A puppy in litter 1 developed vomiting and diarrhoea and another was depressed during the period of seroconversion to CPV, but these could not be confirmed as CPV disease by any method used for virus detection.

Two puppies from litter 9 died at 30 and 31 days of age respectively. At 34 days of age, a puppy developed pronounced dyspnoea and was killed at 37 days of age. Another puppy died suddenly at 37 days of age. Acute to sub-acute non-suppurative myocarditis consistent with that caused by CPV was diagnosed histologically in all cases. CPV was not isolated from the heart, spleen, liver or lymph node of any affected dog. The other three dogs in this litter showed no signs of clinical disease up to 6 months of age. The bitch of this litter seroconverted to CPV between 2 weeks before and 9 days after whelping, indicating CPV infection occurred at this time. All pups in this litter had HI titres to CPV when tested at 9 days of age.

Puppies born to immune bitches (litters 6-8) received passive immunity with original titres estimated by back extrapolation as having been similar to the bitches' titre (Figure 4). The mean half life of maternally derived antibody calculated from Figure 4 was 8.3 days.

The immune status of the bitch could alter the disease susceptibility of the puppies. Puppies born to immune bitches would be protected from prenatal and neonatal CPV infection by the immunity of the bitch and the colostral antibodies respectively. They would therefore be protected during the period of susceptibility to CPV myocarditis, but the decline in passive antibody level would make these puppies

Figure 3. Sequential haemagglutination inhibition (HI) titres to canine parvovirus in sequential bleedings of litters 6, 7 and 8.

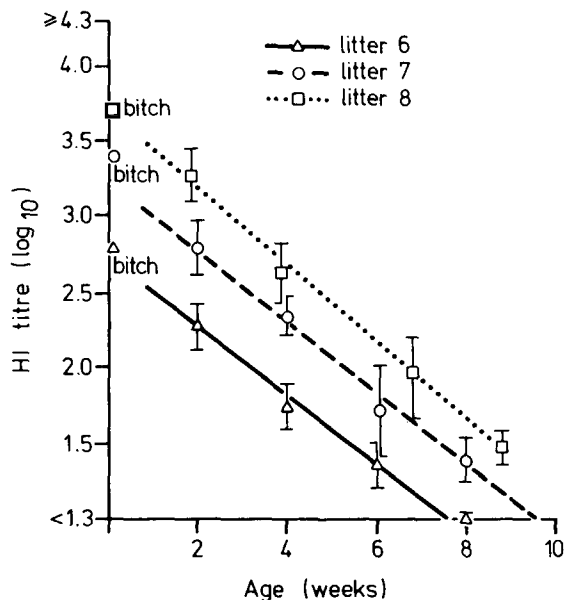
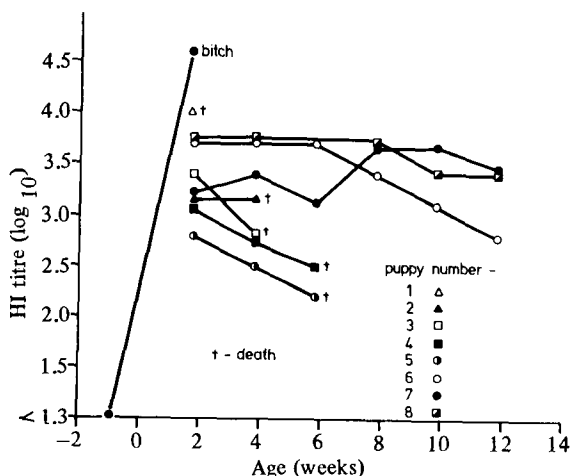


Figure 4. Sequential haemagglutination inhibition (HI) titres to canine parvovirus in sequential bleedings of litter 9. Four puppies died of canine parvoviral myocarditis in this litter.



susceptible to enteritis. Puppies born to non-immune bitches would be susceptible to both enteritis and myocarditis.

BY

C.R. Parrish, R.E. Oliver and Raewyn McNiven
Animal Health Reference Laboratory

- 1 Siegl, G., 1976. *The parvoviruses. Virology monographs, Wein; Springer-Verlag.* 109
- 2 Smith, J.R.; Farmer, R.G.; Johnson, R.H., 1980. *Serological observations on the epidemiology of parvovirus enteritis of dogs. Australian Veterinary Journal 56: 149-150.*