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Brief Communication

THE COURSE OF AN EXPERIMENTAL LIVER FLUKE INFECTION IN THE PIG

Experimental studies have shown that pigs inoculated with metacercariae during the neonatal period are very susceptible, whereas a nearly complete resistance to the establishment of the infection is exhibited by pigs inoculated at approx. 2 months of age (*Nansen et al.* 1972). In these previous experiments each neonatal pig was dosed with only 50 metacercariae and no overt clinical symptoms of fascioliasis were observed.

In the present experiments it was attempted to establish a clinical infection by administration of high larval doses to neonatal pigs. Furthermore, by following faecal egg excretion and by sacrificing the animals at intervals after infection it was the aim to gain information about the size and the persistence of the parasite burdens in the bile ducts. Twelve newborn pigs of 1 litter were randomly allocated into 3 groups. One group served as an uninfected control group. A second group was orally inoculated with 300 metacercariae and a third group with 600 metacercariae when 3 days old. One animal of group I and 1 of group III were excluded from the experiment due to traumatic lesions during early neonatal life (see Table 1). At approx. 2 weeks intervals blood and faecal samples were taken and body weights recorded. The pigs were housed and reared conventionally.

Clinical symptoms and weight gain differences were not observed during the sucking period. Eosinophil counts were elevated in groups II and III as compared with group I. Haemoglobin levels were near-normal in all pigs. However, after weaning weight gains became significantly lowered in the infected groups. Thus, at 26 weeks the average weight of the 7 infected pigs was 66 kg as compared with the average weight, 81 kg, of the controls, the difference being highly significant ($P < 0.01$). From approx. 16 weeks after infection subnormal haemoglobin levels were found in the infected pigs, 7.8—10.0 g/100 ml. Eosinophil counts from this time and onwards were usually within normal ranges. Several infected pigs were meagre and in a poor general condition. Faeces were of a normal consistency.

Table 1. Experimental design and recovery of parasites.

		Pig No.	Post mortem, weeks after infection	Number of adult flukes	Percentage "take" of parasites
Controls	Group I	1	26	0	0
		2	30	0	0
		3	30	0	0
300 metacercariae at birth	Group II	5	35	162	54
		6	26	147	49
		7	26	195	65
		8	35	19	6
600 metacercariae at birth	Group III	9	excreting eggs 20 months p.i.		
		10	35	282	47
		12	30	117	20

The first fluke eggs were demonstrated in the faeces from 2 animals 8 weeks after infection. At 10 weeks all infected pigs excreted fluke eggs, and until 16—18 weeks there was a gradual increase in faecal egg counts. From this time there was a tendency in each animal to maintain a relatively constant faecal egg output. From 16 weeks after infection faecal egg counts were usually in the range of 20—50 e. p. g. It appears from Table 1 that the number of parasites recovered at post mortem was somewhat variable but usually high. Thus, the percentage "take" of the parasites was comparable with that found in previous experiments (*Nansen et al.*). No significant difference in the size of fluke burdens was seen between the pigs of the 300 and the 600 metacercariae dose levels. It is important to emphasize that the results listed in the table do not indicate a decreasing fluke burden within 35 weeks after infection. Furthermore, in pig No. 9 there was a rather constant faecal egg output until its third farrowing approx. 2 years after infection, when egg counts dropped within a few months and no further eggs were demonstrated. The pathology of the livers was comparable with that described previously (*Nansen et al.*). In cattle which is recognized as a relatively resistant host a significant reduction in the acquired parasite burden from 20 weeks and onwards seems to occur (*Doyle* 1972). This appears not to be a feature in the pig as indicated by the results obtained here. It appears that the parasite having entered the bile ducts seems to escape

the restrictive mechanisms of the host for a long period. In this context it is probably worth-while to note that bile duct calcification is not a feature of porcine fascioliasis.

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