An Abattoir Survey on the Pathology of Swine Livers

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ABSTRACT
A five-week study on the pathology of condemned livers of 100 pigs comprising 75 porkers and 25 sows at Shah Alam abattoir was conducted. The liver lesions consisted of 36 with milkspots, 16 with perihepatitis, 12 abscessations, 11 with cholangiohepatitis, 8 with cholangitis, 5 with nodular hyperplasia, 4 with focal necrosis, 3 with post-necrotic scarring, 2 with lipidosis and one case each of cystic bile duct hyperplasia, massive necrosis and hepatocarcinoma. Milkspots due to migration of Ascaris suum larvae was a major problem in porkers (41%). Fourteen (39%) of the milkspot livers were severely affected having a 4+ lesion score with all the lobes affected. Perihepatitis dilihat hanya dalam babi porker dan hiperplasia nodular hanya dilihat dalam babi betina tua. Escherichia coli dan Klebsiella sp. adalah dua spesies bakteria yang kerap dialami daripada perihepatitis. Penyakit-penyakit yang mungkin menyebabkan lesi-lesi yang dilihat dibincangkan.

INTRODUCTION
The liver is the principal organ of metabolism for many endogenous and exogenous substances and as a result is one of the most frequently damaged organs in the body. It has a large capacity to regenerate in response to injury and as a result livers of clinically healthy animals show a spectrum of disease conditions at slaughter. In a study of 8,558 swine from an abattoir in Malaysia, the causes of condemnation of livers comprised 0.12% with milkspots, 0.06% with cirrhosis, 0.05% with fatty change, 0.02% with abscesses and 0.01% with other changes (Tham and Sheikh-Omar, 1981). In another study, the majority (71.4%) of the livers of 5,466 swine was condemned due to milkspots (Yap et al., 1983).

This paper reports a survey on the pathology of livers of pigs slaughtered at the Shah Alam abattoir near Kuala Lumpur.
sis. Post necrotic scarring was seen in 3 livers which had typically marked periportal and portal fibrosis as well as distortion of hepatic lobules.

One case each of cystic bile duct hyperplasia, massive necrosis and hepatocarcinoma were also observed in sows. The first had cystlike dilations of bile duct with hyperplastic cuboidal epithelium. Massive necrosis was seen in a brown and friable liver which histologically revealed necrosis of hepatocytes of entire lobules which were filled with erythrocytes. The liver with hepatocarcinoma was enlarged and had a single raised nodule which appeared homogenously brown and multilobulated on the cut surface. Histologically, there was loss of normal liver architecture with neoplastic cells present as solid masses separated by connective tissue septa. The cells were large round with prominent round to ovoid hyperchromatic nuclei and had no resemblance to normal hepatocytes.

**DISCUSSION**

The high frequency of livers with milkspots in this study is consistent with the findings of other workers (Bottle et al., 1975; Polley and Mostert, 1980). This means that infection with the causative agent *Ascaris suum* is a problem in porkers in Malaysia and is most likely due to improper deworming schedules and poor sanitary measures at the farms. However, work done overseas has shown that *A. suum* infection still approaches 100 percent despite widespread use of anthelmintics and confined housings (Froe II, 1982). Egg of *A. suum* are very resistant to harsh environmental conditions and have been found to remain viable in manure collection pits up to 14 months (Smith, 1979). Untreated, infected pigs act as an important source of infection to other pigs by shedding 'infective' eggs when they reach 8 weeks of age thus contaminating the stalls (Froe II, 1982).

The pigs studied were clinically healthy. They were infected with *A. suum* probably at a grower phase and were able to acquire immunity against the parasite. Had the infection developed during the prestarter and starter phases, high mortalities and growth retardation would have been prominent (Froe II, 1982). Segments of ascaris larvae and aggregations of lymphoid cells were not observed in this study because the lesions had been going on for some time. Such segments have been detected 21 days post infection with ascaris (Copeman and Gaafar, 1972).

It was interesting to find perihepatitis in this study but the cause has remained unestablished. Copeman and Gaafar (1972) described the possibility of ascarid larval migration causing clouding of the capsule 24 hours after infection and progressing to opacity by the 12th day. *Mycoplasma hyorhinis* and *Haemophilus parasuis* are the other possible causes (Leman et al., 1981). In this study, all the affected livers had marked eosinophil infiltration suggestive of parasitic involvement.

The isolation of bacteria from the liver abscesses in mixed cultures mainly consisting of *Escherichia coli*, *Klebsiella* sp. and *Staphylococcus aureus* are similar to the findings of other workers (McCracken and McCaughey, 1973; Engvall and Schwan, 1983). The one liver abcess due to *Pseudomonas pseudomallei* had typical microscopic lesions of melioidosis (Omar, 1963; Thomas et al., 1981).

Nodular hyperplasia which was seen in sows was consistent with the findings of Hayashi et al. (1983) who reported an incidence of 40 per million pigs and suggested hepatocarcinogens as a possible cause.

Hepatocarcinoma was the only neoplasm seen. Its occurrence is low in pigs, occurring at the rate of one per 5.5 million pigs (Moulton, 1978).

Hepatic lipidosis as seen in this study has been reported by Yap et al. (1983) at a higher frequency (11.9%). This problem usually arises when the fat is mobilised too rapidly from various fat depots when the animal is undernourished (Jubb and Kennedy, 1970). It is also seen in pigs suffering from severe protein malnutrition causing great reduction in hepatic phospholipid and disturbance in lipid metabolism (Gupta, 1973).
The source of the pigs studied could not be traced due to complete lack of history and hence epidemiological inferences could not be made. However the data presented do provide further information on the spectrum of disease conditions occurring in livers of slaughtered pigs.

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REFERENCES


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