HISTOLOGICAL ARGUMENTS CONCERNING HEPATIC LARVAL MIGRATION IN NATURAL INFESTATION WITH ASCARIS SUUM IN PIGS

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Summary

Fragments of the liver were collected and processed histologically, from six swine four months age, having positive coproculture tests for *Ascaris suum*. On microscopic examinations were observed larval migration routes. A small number of them did not present reparatory processes, which showed that they were relatively recent. Most of the areas affected presented reparatory processes in different stages of consolidation. The lobules from affected areas presented structural changes by different intensity, with the appearance of pseudolobules or even total disorganisation with the persistence of small groups of hepatocytes dispersed in connective tissue proliferated in the area. In some portions, connective tissue occupied more than half of the section surface and has an obvious tendency of fibrous consolidation. Expanding of fibrous areas by repeated infestation could be represent one of the factors that start liver cirrhosis.

Key words: *Ascaris suum*, larvae migration, hepatic lesions.

Introduction

Although the modern systems of pigs exploitation have reduced the impact of many parasitic diseases, infestations with *Ascaris suum* continue to be a problem for farmers. It is hard to find a free infestation unit and in some regions the prevalence of infestation increased (Roepstorff and Nansen, 1994). Relatively recent studies draw attention to the possibilities of human infestation with *Ascaris suum* (Anderson, 1995; Maruyama et al., 1996; Murrell et al., 1997). During their migration, *Ascaris suum* larvae reach the liver where they damage cause marked lesions (Urban and col., 1985). In this context, we considered it appropriate to do histopathological investigations on liver from pigs infected with *Ascaris suum*, to assess the severity of liver injuries and the way which reparatory processes devolve in affected areas.

Material and methods

The study was conducted on 6 swine 4 months age, which had positive coproculture for *Ascaris suum*. With the slaughter of animals pieces of liver in the form of slices with thickness of 5 mm were collected, which were fixed than for 24 hours in a mixture Heidenhain’s Susa. After the period of fixation, the pieces were dehydrated with ethylic-alcohol, clarified with butyl alcohol and included in paraffin. Sections with thickness of 5 µm have been made, and for staining was used Goldner’s Trichrome stain method.

Results and discussion

On microscopic examination, the liver presented lesions resulting from the migration of parasites larvae (Fig. 1), with differences from one area to another. There were a small number of cavities without any reparatory processes, even discreet. At their level, moderate processes of hepatocyte necrosis with detachment of affected hepatocytes were observed and in
lumen there was a mass of moderate necrosis and a few red blood cells. Most of the areas through which the parasites migrated are occupied by a young connective tissue in various stages of consolidation. Most of them and the largest are arranged peripheral, from the capsule up to a certain depth. Here can be highlighted many issues appeared as a consequence of mechanical and toxic aggression of parasites. In some affected areas, interlobular connective tissue occupies more than half of the surface, and hepatic lobules show remarkable changes (Fig. 2). Some lobules keep the appearance of a normal lobule, but appear smaller or much smaller than normal lobuli. Usually these lobules are found at the periphery of the affected areas, close to normal lobules or very near normal. Here also exist lobules which extended into the affected area by some branches formed by hepatocytes belts, fragments of belts even isolated hepatocytes, branches which keep only in their axe, remotely, a very small architecture similar to that of the hepatic lobule.

In some cases, these extensions are formed only from fragments of belts and isolated hepatocytes, separated by connective tissue which gradually invades the area. In those portions of disorganized lobules, an impressive eosinophilic infiltrate is present, which decreases slightly in intensity to the middle portion of the affected areas. A large number of lobules from affected areas appear very altered, with aspect of pseudo-lobules.

There are also isolated hepatocytes or groups consisting of 2-4 cells with greatly altered form, dispersed in connective tissue proliferated in the area. They are what is left of some seriously affected lobules or which have disappeared as an entity.

Aspects observed shows that in natural infestation with *Ascaris suum*, hepatic migration of the larvae causes significant structural changes, especially in the subcapsular area. Areas showing significant structural changes are quite large and in those areas characteristic structures are much modified or totally disorganized.

The presence of isolated hepatocytes in the connective tissue proliferated in the area, clearly shows that some lobules has disappeared as an entity, and their number is difficult to be approximated. The presence of the parasitic routes where reparatory processes are absent, shows that there larvae have migrated relatively recently, suggesting the persistence of the source of infestation. The observation is supported also by the presence of a large number of eosinophils, which also suggests that the direct or indirect action of the parasites has not yet completely stopped, even if most affected areas are occupied by connective tissue in the full process of proliferation. By structural disorganisation of hepatic lobules from the affected areas, a relatively large number of morpho-functional hepatic units will be lost, which will have some repercussions on the liver functionality. Areas damaged by larva migration are fixed in the final, but not with new hepatic lobules with should replace to those destroyed, but by the connective tissue that determines, in the final, fibrosis of the affected areas.

The apparition of such fibrosis areas affects liver function partially. Practically it is difficult to assess at what level of damage can be reached by passing through several cycles of infestation, which could extend far fibrosed areas. Anyway, the expansion of the fibrosed areas after repeated migration of larvae of *Ascaris suum* could be constitute, amongst other factors, a point of start in beginning of hepatic cirrhosis.

**Conclusions**

During hepatic migration, *Ascaris suum* larvae produce severe damages, on large portions from subcapsular area and lower in liver depth.

In addition to structural changes of the hepatic lobules whose severity in some cases lead to total disorganization, in the affected areas, is observed the connective
tissue in full process of proliferation, with obvious tendency of fibrosis.

Expanding of the fibrosed areas by repeated infestation could be, along with other factors, a point of start in the begging the hepatic cirrhosis in pigs which not receive antiparasitic treatments.