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Abattoir Survey of Kidney Condemnation in Food Animals in Shiraz, South of Iran (1999-2004)

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Abstract: Renal disease is not uncommon in food animals and information resulting from abattoir data is a good source for evaluation and monitoring of renal disease in livestock. In this regard daily condemnation records in an abattoir in Shiraz, Fars province, south of Iran during 20 March 1999 to 19 March 2004 was used to determine the condemnation rate of kidneys in cattle, sheep and goats in the region. A total of 844,309 animals (cattle 131,716; sheep 577,090; goats 135,233) were slaughtered and overall 5.4, 1.1 and 2.3% of kidneys were condemned in cattle, sheep and goats respectively. Nephritis was responsible for 66, 25 and 16% of total condemnation in these species respectively. There was significant downward trend for total kidney condemnation and nephritis specific condemnation in cattle and sheep during the study period. In goats, rejection due to nephritis was decreased but total rejection did not decline significantly. Implementation of intensive livestock rearing systems and replacement of many traditional small-holder farms with industrial ones in recent decades all over the country including Fars province may be an important factor in the overall improvement of health and welfare of livestock in the region. This study could provide preliminary data for monitoring kidney disease and a useful baseline for future comparison.

Key words: Abattoir, kidney, livestock, nephritis

Introduction

Renal disease is not uncommon in food animals and the function of kidneys in metabolism, fluid balance and excretion make it an important system for close inspection. Information resulting from abattoir inspection records for kidney condemnation is a useful source of data for evaluation of trend in renal disease including nephritis in food animals. Nephritis is an inflammation of kidneys and depending on the part involved may be broadly divided into glomerulonephritis, interstitial nephritis, acute tubular necrosis and pyelonephritis. All of them usually occur as a part of bacterial and viral systemic disease or following consumption of certain irritant substances or poisons.

There are few surveys on kidney disease in slaughtered food animals (Rosenbaum *et al.*, 2005; Uzal *et al.*, 2002; Monaghan and Hannan, 1983). Most studies on kidneys in slaughterhouse were conducted to detect pathogenic bacteria and to trace heavy metals or drug residues (Lopez Alonso *et al.*, 2002; Feresu, 1992; Korsrud *et al.*, 1998).

Present study was conducted in Fars province, south of Iran to determine the overall condemnation rate of kidney and rejection attributed to nephritis in cattle, sheep and goats in the region. This study could provide preliminary data for monitoring kidney disease and a useful baseline for future comparison.

Materials and Methods

This slaughterhouse survey was conducted in Shiraz, Fars province, south of Iran. As a part of ongoing surveillance system in the province, every slaughtered animal is examined by meat inspectors

and reasons for condemnation of organs are recorded. Decision for rejection is made on the basis of visual inspection, palpation and cutting the kidneys open if necessary. Any abnormality in the shape, size, consistency or color of a kidney leads to its rejection. For recording, however, reasons for condemnation are categorized as nephritis and miscellaneous.

All daily condemnation records for cattle, sheep and goats in the "Industrial Meat Complex Abattoir" in Shiraz, during 20 March 1999 to 19 March 2004 (equal to 1378-1382 H.S. Iranian calendar), was used as the source of data from which the prevalence of kidney condemnation was extracted. For statistical analysis investigation of secular trend was done using linear regression analysis. Seasonal pattern was investigated by χ^2 test stratifying for years of study.

Results

A total of 844,039 animals (cattle 131,716; sheep 577,090; goats 135,233) were slaughtered in this five-year period. Overall 6836 (5.4%), 6222 (1.1%) and 3234 (2.3%) kidneys were condemned in cattle, sheep and goats, respectively. Nephritis specific condemnation rates were 3.4, 0.27 and 0.37% and was responsible for 66, 25 and 16% of total rejection in these species, respectively. In cattle and sheep, there was significant decline in the prevalence of nephritis and total kidney rejection during the study period ($p < 0.001$) (Fig. 1). In goats, rejection due to nephritis was decreased during five-year ($p < 0.001$); however, total rejection did not decline significantly. Seasonal variation in total kidney rejection and condemnation due to nephritis is shown in Fig. 2. No significant seasonal pattern was seen in the study period for cattle and sheep, however rate of total kidney condemnation in goats was significant ($p < 0.01$).

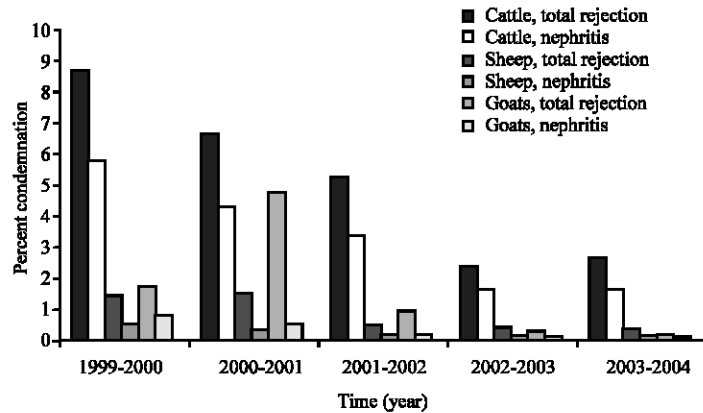


Fig. 1: Frequency of kidney condemnation in Shiraz, south of Iran during 1999-2004

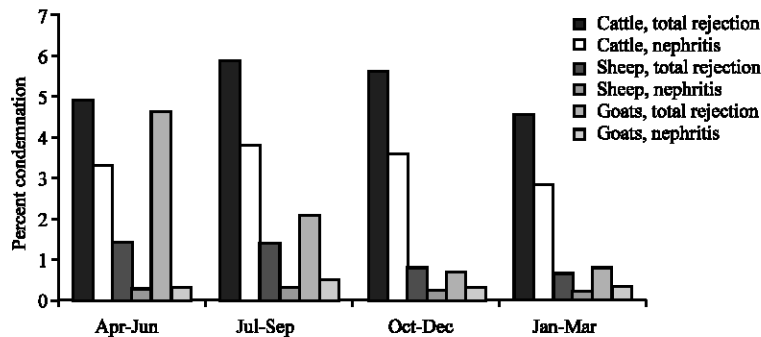


Fig. 2: Seasonal kidney condemnation in Shiraz, south of Iran during 1999-2004

Discussion

There are few surveys on kidney disease in slaughtered food animals. A survey of the prevalence and type of kidney lesions in cattle was carried out in a Dublin abattoir during 1979-80. Of 4166 animals examined, 4.2% had abnormal kidneys and the most common reason for rejection was focal interstitial nephritis (Monaghan and Hannan, 1983). In another slaughterhouse survey, Rosenbaum *et al.* (2005) found gross signs of pyelonephritis in twenty one rejected kidneys from 2428 cows (0.87%) in Pennsylvania. In the present study the total kidney condemnation rate in cattle (5.4%) is comparable with Dublin study. Up to the knowledge of author there are no local or international figure to compare with rejection rates in sheep and goats. Unfortunately in our study the subtypes of nephritis were not recorded, however, the overall declining trend especially in cattle may indicate the reduction of all possible contributing factors. These factors could be various pathogenic microorganisms or toxic substances.

During recent years in the whole country including Fars province, there have been considerable effort to implement intensive livestock rearing systems in the commercial scale. During this process many traditional small-holder farms were replaced by industrial farms. This is true especially for cattle and in a lesser degree for sheep and goats. Considering these changes, the observing trend in the kidney condemnations is plausible. It may reveal the success and efficiency of the new food animal rearing systems as well as overall improvement in animal health and welfare. This is in agreement with previous reports indicating the significant decrease of liver and lung condemnation due to parasitic disease in the Fars province at the same period (Ansari-Lari and Moazzeni, 2006; Ansari-Lari, 2005).

In conclusion, however, it must be remembered that slaughter prevalence may be underestimated the actual prevalence, but it could be acceptable as a good surrogate marker for the population occurrence.

The present survey provides a preliminary baseline data for the future monitoring of renal disease. Now, on the other hand, we need more precise classification of nephritis on the basis of macroscopic appearance and even microscopic or bacteriologic examination to identify the specific pathogens involved. This aids in planning more specific programs for promotion of animal health.

Acknowledgment

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