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Short communication *Pathology*

Prevalence of bovine tuberculosis at the SODEPA Douala abattoir, Cameroon (1995 – 2003)

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ABSTRACT

This paper reviews tuberculosis and other pathological cases of slaughtered cattle recorded in "SODEPA" (*Société de Développement et d'Exploitations des Productions Animales*) Douala abattoir from April 1995 – May 2003 to determine the status of Bovine tuberculosis and other pathological conditions in Zebu cattle. Out of a total of 385,784 (3782.20 ± 425.02) zebu cattle slaughtered during this period, 3,893 (20.17 ± 25.35) pathological lesions were recorded with 81.53 % (3174; 32.72 ± 30.30) of them being due to tuberculosis. Prevalence rates of 1.01% for all the cases put together, 0.82% for tuberculosis alone and 0.19% for the non-tuberculosis cases were obtained for the 8-year study period. The other 18.47% (719; 7.90 ± 5.80) of non-tuberculosis cases were made up of liver (76.77%), non-tuberculosis lung (10.29%), cysticercosis (5.98%), enlarged kidney (2.50%), traumatic (2.22%) and pericardiac (2.22%) lesions. Bovine tuberculosis lesions were generally 3 – 5 times more prevalent ($P< 0.05$) than the other lesions combined. Although the rates of occurrence of the pathological cases were highest in April and September of 1997 and 1998, there was no significant association between cases and season. The paper therefore confirms that bovine tuberculosis is endemic in Cameroon and suggests that systematic knowledge on the biodiversity of the causative agents, epidemiology and control of the disease as well as the interrelationship between animal and human tuberculosis should be updated.
Key words: *Zebu cattle, pathological lesions, tuberculosis, prevalence, abattoir, Douala- Cameroon*

RESUME

Cet article évalue la prévalence de la tuberculose et autres pathologies à l'abattoir de la SODEPA (Société de Développement et d'Exploitations des Productions Animales) de Douala au Cameroun entre Avril 1995 et Mai 2003, dans le but de déterminer le statut actuel de la tuberculose bovine et autres pathologies chez le zébu. Il ressort d'un total de 385 784 (3782,20 ± 425,02) zébu abattu pendant cette période que, 3 893 (20,17 ± 25,35) lésions pathologiques ont été enregistrées avec 81,53% de cas de tuberculose. Pour cette période d'étude de huit ans, le taux de prévalence globale était de 1,01%, avec 0,82% pour la tuberculose seule et 0,19% pour les cas non liés à la tuberculose. Ces lésions non tuberculeuses ont été observées au niveau du foie (76,77%), des poumons (10,29%) et des cas de cysticercose (5,98%), d'hypertrophie du foie (2,50%0, de traumatisme (2,22%) et des lésions péricardiaques (2,22%). Les lésions liées à la tuberculose étaient 3 – 4 fois plus importante ($P<0,05$) que les autres lésions pathologiques seules ou combinées. Quoique le taux d'incidence de cas pathologiques était élevé aussi bien en avril et septembre qu'en 1997 et 1998, il n'y avait aucune association significative entre les cas et la saison. Cet article confirme donc que la tuberculose bovine au Cameroun est endémique et suggère que les connaissances systématiques sur la biodiversité des agents causaux, l'épidémiologie et le contrôle de la maladie, ainsi que la relation entre la tuberculose animale et humaine soient mises a jour.
Mots clés : *Zébu, lésions pathologiques, tuberculose, prévalence, abattoir, Douala-Cameroun.*

INTRODUCTION

Tuberculosis is an important ancient fatal disease of all warm-blooded animals, which in the last decade has re-emerged as a major worldwide public health hazard. The disease presents particularly serious problems in cattle and humans all over the world [1,2] and the vast majority of active cases are in developing countries. The tubercle bacillus (*Mycobacterium tuberculosis*) is the number one cause of the disease in man, with the closely related *M. bovis* severely affecting cattle [3, 4, 5]. In apparently healthy individuals, the majority of infections result from reactivation of an original infection or previously dominant organisms. Poor lifestyle, concurrent infections such as the acquired immune deficiency

syndrome (AIDS) in humans or poor management and environmental stress factors also greatly predispose to the high level of re-occurrence of tuberculosis [1, 3, 6].

Bovine tuberculosis is also an important wasting zoonosis associated with enormous economic losses in both animals and man [1, 2, 3]. Human losses cannot be quantified easily since lives are involved but tuberculosis together with AIDS and malaria have been ranked as top infectious disease killers of man in the world today [2, 7]. However, losses in animals are assessed on the basis of several factors including condemnations of carcasses during meat inspection, payment of compensations to the owners, shorter lifetime or death of animals, payment for veterinary services, sterility, reduced beef and milk production and restrictions in exports of beef.

Although there is limited literature on the biodiversity and epidemiology of *Mycobacteria* causing tuberculosis, as well as the interrelationship of animal and human tuberculosis in Cameroon [5], the existence and importance of the disease in the indigenous cattle and human population is increasingly being locally acknowledged. This paper therefore reviews recorded tuberculosis and other pathological cases at the "SODEPA" Douala abattoir for 8 years (April 1995 to May 2003) to determine the status of bovine tuberculosis and other pathological conditions in slaughtered Zebu cattle.

MATERIALS AND METHODS

Information contained in this paper is based on the analysis of data on meat inspection records of zebu cattle slaughtered in the "SODEPA" abattoir in Douala. Data on tuberculosis and other pathological cases were extracted as found in each case from April 1995 to May 2003. Evidence of specific pathological cases was based on post mortem examination of characteristic lesions on organs at meat inspection as earlier described [1, 3, 8, 9].

Microsoft Excel 2000 programme was used to generate frequency distributions of the annual and monthly prevalence of tuberculosis and the other pathological liver, non-tuberculous lung, cysticercosis, enlarged kidney, traumatic and pericardiac lesions from the records as described by Benet *et al.* [10] and Pfeiffer [11]. A chi-square test and Z-formula were used to analyse the differences and associations between the frequency distributions and prevalences obtained.

RESULTS AND DISCUSSION

Cattle slaughtered at the SODEPA Douala abattoir were mainly of the Zebu type; originating from within the country especially from the Western Highlands and less often the Northern regions. During the 8-year study period, a total of 385,784 (3,782.20 ± 425.02) cattle were slaughtered with 3,893 (20.17 ± 25.35) pathological lesions recorded; 81.53% (3,174; 32.72 ± 30.30) of which were tuberculosis cases. The remaining 18.47% (719; 7.90 ± 5.80) non-tuberculosis cases were made up of liver lesions (552; 76.77%) due to liver fluke, abscess or cirrhosis; non-tuberculosis lung lesions (74; 10.29%) due to abscess, pleuropneumonia, emphysema; cysticercosis (43; 5.98%); enlarged kidneys (18; 2.50%); traumatic lesions (16; 2.22%) and pericardiac lesions (16; 2.22%).

Pathological lesions were recorded throughout the study period and the overall distribution of the cases was very similar to that of tuberculosis alone (Figures 1 and 2). Although the distribution of these cases was not significantly influenced by season, the observation of cases peaked in April and September (Fig. 1) or 1997 and 1998 (Fig. 2). The higher occurrences during the months of March, April, August and September could be linked to sudden stress experienced during the transition from dry to rainy season (March and April) and peak of rainy season (August and September) in the Littoral and Western Highland areas of Cameroon. However, religious feasts, social and cultural ceremonies always lead to an elevated slaughtering rate of cattle in Africa and must have accounted for the slightly higher prevalence rates recorded in December compared to the other months. The steady increase in the annual prevalence of cases including tuberculosis between 1995 and 1997 or 1998 could be associated with lack of control measures.

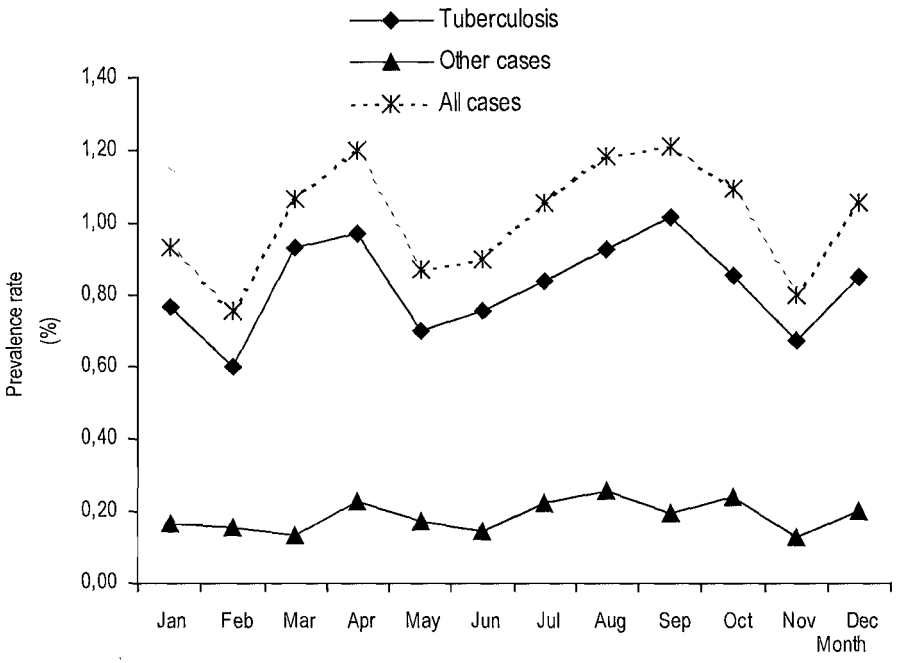

Figure 1: Distribution of monthly prevalence rates of Bovine tuberculosis and other disease conditions of cattle in "SODEPA" abattoir Douala (April 1995 - May 2003)

Also, prevalence rates of 1.01% for all the cases put together, with two being zoonoses (bovine tuberculosis 0.82% and cysticercosis 0.01%) were obtained for the entire study period. Bovine tuberculosis was observed to be 3 – 5 times more ($P<0.05$) frequent than all the other cases combined and also more likely to occur than the other cases, singly or combined. However, the calculated odds ratios were generally greater or smaller than one for the entire study period. This indicated the potential cause – disease relationship for these cases, which was stronger for bovine tuberculosis, in cattle producing regions in Cameroon. The 0.82% infection rate for bovine tuberculosis obtained here was higher than 0.49% in Sokoto - Nigeria [12] but lower than 3.1% in Ho – Ghana [13] obtained in similar studies.

Tuberculin testing and elimination of infected animals, for example, is not a routine practice in Cameroon. In parts of the world where this is done, it is uncommon to detect such relatively high prevalence at meat inspection. *Mycobacterium bovis* infection rates ranging 3 – 6% were obtained in tuberculin testing trials in Ho – Ghana which agreed with the trend of bovine tuberculosis diagnoses and also confirmed from slaughterhouse data [13]. The drop in prevalence after 1998 was due to a large extent to increased awareness of the public health, and to a minor extent on the economic importance of bovine tuberculosis. Nonetheless, clinical meat inspection records before April 1995 were poorly done and could not be relied upon.

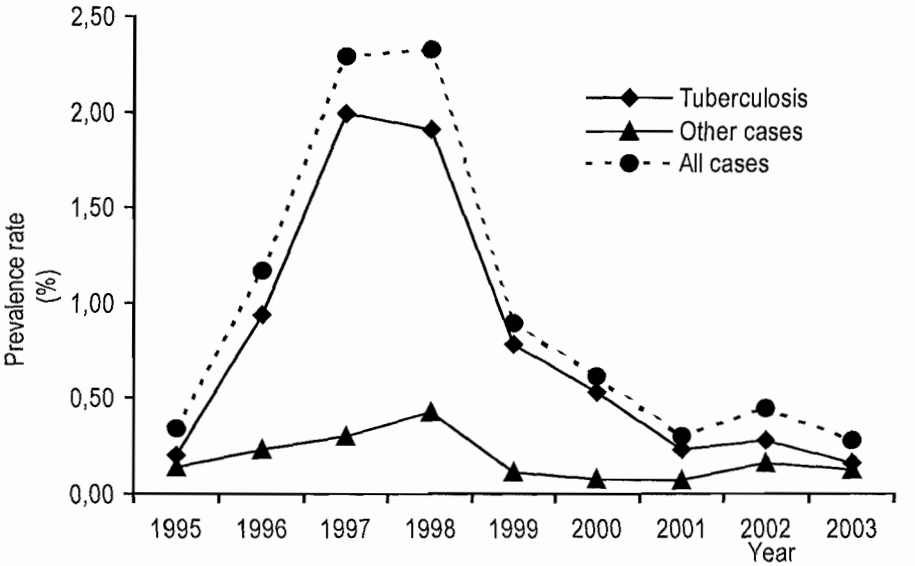

Figure 2: Evolution of yearly prevalence rates of Bovine tuberculosis and other disease conditions of cattle in "SODEPA" abattoir Douala (April 1995 - May 2003)

This study has shown that pathological cases, especially bovine tuberculosis, are endemic in slaughtered Zebu cattle in Cameroon. The introduction of routine tuberculin testing and elimination of infected animals, intensification of meat inspection accompanied by laboratory diagnoses of suspected pathological lesions are therefore strongly recommended. This will aid in understanding the exact epidemiology of cases as well as easy elucidation of the nature of the problems. It would also be important to update control measures and interrelationship between animal and human zoonoses in the country.

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