Pathomorphological investigations on the incidence of clinical spondylolisthesis (kinky back) in different commercial broiler strains

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SUMMARY

The aim of the present study was to investigate the incidence of spondylolisthesis in broiler chickens of 3 commercial hybrids (Ross 308, Cobb 500 and Pureline) from the same fattening farm. The discovered chickens with typical signs of spondylolisthesis (posterior paralysis) in each flock of 17,000 birds were registered, marked, and separated in an isolator, where they were kept with constant access to food and water until the time at the respective flock was slaughtered. The mean ages at which clinical signs of the disease appeared were 26.6 days for Ross 308, 26.2 days for Cobb 500, and 27.5 days for Pureline. The overall posterior paralysis prevalence was 0.17% (571 affected chickens from the 3 examined hybrids) and a higher incidence was recorded in Cobb 500 (0.24%) than in Ross 308 (0.14%) and in Pureline (0.13%). No significant correlation was established between spondylolisthesis occurrence and breeder ages or the earliest day of disease detection. Gross and conventional histological examination of spine samples (10 from each flock) revealed degenerative spondylolisthesis lesions (ventral dislocation of T4 (4th thoracic vertebra)) in 57.8% of samples, mainly in Cobb 500 hybrids (66.7% of samples) and spondylolisthesis (degenerative lesions near T4 and T5) in 33.9% samples. These results suggest that despite a significant selection work primarily aimed at a shorter fattening period, there were no variations in the age occurrence of spondylolisthesis.

Keywords: Spondylolisthesis, prevalence, broiler chickens, strain, thoracic vertebra.

RéSUMÉ

Etude anatomopathologique de la spondylolisthose clinique (kinky back) chez différents hybrides de poulets de chair

L’objectif de cette étude a été d’évaluer l’incidence de la spondylolisthose au sein de 3 lignées de poulets de chair (Cobb 500, Ross 308 et Pureline) issues du même centre d’engraissement. Les poulets présentant des signes cliniques typiques de spondylolisthose (paralysie postérieure) dans chaque lot de 17000 oiseaux ont été isolés jusqu’au jour d’abattage du lot correspondant. Les âges moyens d’apparition des signes cliniques ont été de 26,6 jours pour les Ross 308, 28,2 jours pour les Cobb 500 et 27,5 jours pour les Pureline. Sur l’ensemble des 3 lignées, la prévalence des paralysies postérieures a été de 0,17% (571 oiseaux affectés), et elle a été plus élevée chez les Cobb 500 (0,24 %) que chez les Ross 308 (0,14 %) ou les Pureline (0,13 %). Aucune corrélation significative n’a été mise en évidence entre la fréquence de la spondylolisthose et l’âge des reproducteurs ou le premier jour d’apparition des symptômes. Les examens conventionnels anatomiques et histologiques des échantillons de moelle épinière recueillis (10 par lot) ont révélé des lésions de spondylolisthose (dislocation de T4 (4ème vertèbre thoracique)) dans 57,8 % des échantillons, plus particulièrement chez les Cobb 500 (66,7 %) ainsi que des lésions de spondylolyse (lésions dégénératives de T4 et de T5) dans 33,9 % des échantillons. Ces résultats suggèrent qu’en dépit d’un travail de sélection important visant à réduire la période de finition, l’apparition de la spondylolisthose est indépendante de l’âge des poulets.

Mots clés : Spondylolisthose, prévalence, poulets de chair, lignée, vertèbre thoracique.

Introduction

Spondylolisthesis, also called as kinky back, was reported for the first time in broiler chickens in Great Britain, although it was probably observed earlier [8]. Thereafter, it was described in Australia by Kelly [5], in Canada by Riddell and Howell [10] and in Germany by Bergmann [2]. The disease is probably seen all over the world. A genetic predisposition towards spondylolisthesis was assumed to exist [8, 10, 13]. This assumption and the observations that some affected birds satisfactorily recovered from posterior paralysis have led to the breeding hybrid broiler chickens characterized by a high prevalence of spondylolisthesis, used in ulterior studies [9]. The consequent research led to the hypothesis that the spread of clinical spondylolisthesis could be dependent on the genotype [8, 13]. The occurrence of the disease in chickens from different hatchs, bred under widely different conditions and fed with different feed presumes but does not confirm that genotype could be more important than the environment and feeding in the development of the defect under commercial conditions in western Canada [9].

Wise [13] demonstrated that the development of subclinical spondylolisthesis could be reduced by feeding with a diet significantly diluted with fibre during the first week of life. Such feed markedly reduces growth in experimental birds, and it is rather unlikely to be used in commercial conditions. An attempt was made to explain the lack of clinical spondylolisthesis at the first hatch of the first generation by reduced growth rates [9]. A number of studies examined the importance of nutrition in the occurrence of the condition, causing losses in commercial flocks in regions where rations are typically based on wheat [2, 5, 8, 10, 12].

The disease occurrence is typically dependent for the broiler type of chickens. In some flocks the percentage of affected birds can reach 2% [3]. Wise [13] presented evidence that subclinical spondylolisthesis is a developmental abnormality that occurred during the first weeks of life. According to the same

Revue Méd. Vét., 2012, 163, 11, 511-515