



RADIOGRAPHIC ASSESSMENT OF THE DISORDERS OF THE FORELIMB PHALANGES OF NIGERIAN TRADE HORSES AT OBOLLO-AFOR, ENUGU

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Abstract

The aim of the study was to assess the disorders of the forelimb phalanges of Nigerian trade horse using radiographic techniques and to determine if there are sex-related predispositions to the radiographic disorders of the phalanges. Thirty-five (35) Nigerian trade horses at Obollo-Afor horse market between the ages of 5-10 years were used for the study between April and June 2018. After clinical examination, lateral and dorsal radiographic examination of the phalanges of horses that presented with foot related forelimb lameness was carried out. The collected data were subjected to descriptive statistics and association between sexes was analyzed using Chi-square. Statistical significant was accepted at $p < 0.05$. In the thirty five horses with forelimb foot-related lameness, 19 were males and 16 females. Ten (10) horses had luxation of the phalanx, 7 sidebone, 3 bone cyst and 2 Osteosarcoma. The distribution of the forelimb phalanges disorders were more in the males (34.3%) than in the female horses (28.6%) but showed no significant association with sex. In conclusion all the assessed disorders of the phalange precipitated evidence of clinical signs of lameness in both male and female horses.

Keywords: Horse; phalangeal disorders; radiograph; lameness.

Introduction

Ever since horse was domesticated it has been of a great importance to human in many different aspects of life such as draft, transport, sports, ceremonial exhibitions, research purposes, agriculture, warfare, crowd control, as food (meat) and source of variety of products (milk, hide, bone meal) and medicine (Edward, 1994; Grub, 2005). But the usefulness is dependent upon his possession of four good feet (Redden, 2003). This is because foot represents an important structure for sound movement of equine limb during. Any affliction that can cause pain or reduction in the range of motion may seriously affect performance (Anderson *et al.*, 2004).

Phalanges are that part of the limbs distal to the metacarpophalangeal joint (Craig *et al.*, 2001). Equine foot is a unique structure and dominant site for lameness, because it exposed to a tremendous amount of strain and stress in performance horse (Reilly, 1995).

Radiology is an imaging modality most commonly used for determining bone quality and disorders (Vanderperren and Saunder, 2009). It is a standard diagnostic tool used to diagnose phalanges disorders in equine. Radiographic examination gives tremendous insight into the relationship between the structures within the foot and between the foot and distal limb (Thrill, 2002). There is little or no information on the radiographic assessment of the disorders of the phalanges of Nigerian trade horse.

The objectives of the study were therefore, to assess the disorders of the forelimb phalanges of Nigerian trade horse using radiographic techniques and to determine if there is sex-related predispositions to the radiographic disorders of the phalanges.

Materials and methods

This study was conducted at Obollo-Afor horse market in Enugu state located at latitude 6°54'56 north and longitude 7°30'55 east. The horses were brought for sale at the horse market from the Northern part of the country. The research visits to Obollo-Afor horse market were made once a week during the study period between April and June 2018.



All the horses present at the market were examined clinically in standing position and during locomotion and signs of lameness were recorded. Foot of the affected limb was examined grossly for any possible swelling and palpated to evaluate for heat and pain. Thirty five horses of both sexes aged between 5 to 10 years with forelimb foot-related lameness were then purposively selected for further radiographic examination. The selected forelimbs were subsequently subjected to radiographic examination as described by Redden (2003). A portable x-ray generator with exposure factor of 3.2 Amp and 84 Kilvoltage was suspended on the x-ray tripod stand and x-ray cassette held behind the foot using cassette holder. A block was used to elevate the foot above the ground so as to position the foot at the center of the cassette. The obtained radiographs were properly processed and examined using x-ray viewing box. The occurrence and the distribution of the radiographic disorders according to sex were recorded accordingly.

Results

The percentage distribution of the radiographic disorders of phalanges in both sexes was summarized in the table 1. The percentage occurrence of luxation were found highest (28.6%) followed by side bone (20%), bone cyst (8.8%) and osteosarcoma (5.7%). The percentage sex distribution of the radiographic disorders of the phalanx was summarized in the table 2. The percentage occurrence was observed more in male (34.4%) than in female (28.6%) horses. But there was no significant sex related difference between sexes ($P > 0.05$).

Table 1: Percentage distribution of the radiographic disorders of the phalanges

Radiographic disorders	No of occurrence	% Occurrence
Side bone	7	20
Luxation of the P3	10	28.6
Bone cyst	3	8.6
Osteosarcoma	2	5.7
Total	22	62.9

Table 2: Percentage sex distribution of the radiographic disorders

Sex	Total No Sampled	Freq. Of Disorder	% Occurrence
Male	19	12	34.4
Female	16	10	28.6
Total	35	22	62.9

Figure 1: Lateral view of fetlock (circled red area) and proximal

Figure 2: A unilateral side bone of



Fig. 5: Bilateral calcified lateral cartilage (arrows) of the P3 (Side bones)



Figure 4: Luxation of the head of fetlock and pastern (circled yellow)

The higher number of phalanges disorders in male horses could be because male horses are mostly used for traction and sports than the females. This is contrary to Purohit (2005) who reported a higher percentage of radiographic disorders in female than male horses.

Side bone was observed in 20% horses of study, similar observation were made by Bengtsson (1983) who reported that side bone is common in horses above two years. Holm *et al.* (2000) reported that side bone is a frequent cause of lameness in equine species. Factors such as age, heavy body weight, hoof concussion, improper shoeing have been suggested as possible cause of side bone in horses (Scheider and Sticker, 1987). Osteosarcoma is the most common malignancy of bone and a rare condition of the foot (Unni, 1996). A varying incidence of pedal osteosarcoma between 0.2 – 2% has been reported by Unni (1996). Berlin (1984) noted Osteosarcoma in less than 1% of the 6700 foot lesion that he reviewed. In present study Osteosarcoma was found only in two horses (5.7%), and the lesion was found on metaphysis of fetlock and it also extended to proximal sesamoid bone. This observation is in line with Unni *et al.* (1977) who reported that osteosarcoma of the foot is a rare condition of equine species.

Luxation of proximal interphalangeal joint was found highest (28.6%). This could be attributed to transportation injury and inhuman method of offloading of the horses as they were forced to jump down from trailer during the process. Luxation in the horse are thought to be secondary to flexure deformities and may occur acutely secondary to collateral ligament injury (Adams *et al.*, 1995). The proximal interphalangeal is a high load joint, the articular cartilage bone are placed under a greater workload making this structure more susceptible to injury from non-physiological loading (Pool and Meagher, 1990). In the present study the luxation of proximal interphalangeal joint could be of traumatic origin.

Bone cysts are a relatively common disease that affects the joints, usually the stifle, coffin, pastern and elbow joints (Baxter, 1996). However, in this study it was found at the metaphysis of the fetlock. Osteochondrosis (OCD) in horse may also trigger a bone cyst. Bramlage (1996) reported that fast-growing large breed of horses, may be affected by bone cyst. The degree that these cysts affects horse depends on



the age and health of horse, and more importantly, where the cyst is located (Ray *et al.*,1986). A bone cyst is not filled with fluid but consist of weakly formed bone and cartilage that is circular in outline.

Conclusion

Knowledge about the sex distribution of the radiographic disorders of the phalanges will help equine veterinarians in the establishment of adequate management protocol, during diagnosis and treatment of phalangeal disorders.

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