

Frequency of Dental Disorders in Chilean Rodeo Horses Evaluated between 2010 and 2013

Frecuencia de desórdenes dentales en caballos de rodeo chileno evaluados entre 2010 y 2013.

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ABSTRACT

Dental disorders are common in horses, that is why the objective of this study is to determine the frequency of dental problems in Chilean Rodeo Horses and describe the most common dental treatments used in Chile. Oral examinations were performed on 456 Chilean horses and the disorders were observed as follows: Oral soft tissue problems such as lacerations and/or ulcers, were presented in 259 (56%) horses. Regarding to first premolar, it was present in 32% of the horses, all maxillary positioned. Canines were present in 245 (54%) and overlong tooth. Disorders founded in incisors showed supererupted (Tooth overlong) in 147 (32%); ventral curvature in 116 (25%), nevertheless 102 (22%) horses showed no abnormalities. About the diseases found in cheek teeth (premolars and molars), the more prevalent were enamel points in 426 (93%), rostral or caudal hooks in 354 (78%), and ramps in 231 (51%). Confidence intervals between all dental diseases found in the study showed no statistical significance when the horses were analysed by age or gender. When age groups were made, statistical significance appeared X² Pearson (p=0.01), were malocclusion type I was the most common in young, mature and geriatric horses. Other disorders such as problems at the time of eruption, development and periodontal disease were statically similar X² (p=0.07). In relation to treatments it is important to mention that 453 (99%) horses received odontoplasty and 147 (32%) first premolar extraction. This study shows that Chilean rodeo horses have dental disorders similar to other horse breeds, except by small increase in soft tissue damage and incisors problems.

Key words: dentistry, Chilean horses, malocclusions, dental diseases

INTRODUCTION

Post-mortem studies on horses have set prevalences of 80% in dental disorders (mix breed horses) (Dixon 2011). An abattoir survey carried out in Australia showed a frequency of dental problems up to 97.5% in horses from 11 to 15 years of age (Chinkangsadarn *et al* 2015). Dental problems appear to be the third most common medical problem in large animal practice in USA (Anthony *et al* 2010). For example, a study carried out in Brazil determined that from 607 horses examined, 49.9% and 44.5% of different dental problems were found including cheek teeth and incisors respectively.

In Chile, equine dental studies have been rather a neglected field and little information is available regarding the current incidence and range of dental disorders in the general equine Chilean horse population. Muñoz *et al* (2010) found 88% of dental problems from examination of incisors, canines and first premolar in 100 horses. On the other hand, the Chilean horse is a specialized breed of horses with the most antique pedigree register in Chilean Rodeo (four centuries since the Spanish settlers arrived to south America), is a mid-size breed with a big head size and mastication muscles, with a convex nasal and frontal bones. Typically many types of bits have been used for this breed, with some of them causing great injuries to the mouth and soft tissue. Considering the aforementioned, the aim of this study is to determine the prevalence of dental disorders in Chilean horses.

MATERIAL AND METHODS

Routine dental examinations were performed in 456 horses by a Veterinarian with an expertise in equine dentistry (one of the authors (SG)) over a period of 3 years (2010-2013). A total of 168 mares, and 288 males (stallions and geldings), with ages from 4 to 23 years (median 9 years old) were analysed. The evaluating clinical data included age, sex, reason for dental examination and oral examination findings in oral and dental evaluation, treatment and outcome.

Clinical examination of each horse was performed following sedation with 1 mg/kg IV xylazine, 0.08mg/kg IV azepromazine and 2.2mg/kg tramadol. The incisors and canines were first examined by inspection and palpation, as well as lateral excursion to molar contact (EMC) (Rucker 2004). After fitting a McPherson speculum, the oral cavity was rinsed with dilute chlorhexidine and visual and manual examination was performed using a head lamp, dental mirror and a probe. After performing the exam, findings were registered using dental charts and dental identification using the Triadan-system (Klugh 2010).

Confidence intervals (CI 95%) were applied for assessing statistical significance between all the pathologies individually found, age or gender. Also age groups were made, and Chi Square of Pearson was applied to determine statistical significance with oral diseases types (p -value ≤ 0.05) through the software Analyze-it General 1.71 v.2005 for Microsoft Excel.

RESULTS

The most frequent causes of dental referral in the present study were discomfort with the bit (mouthpiece) in 316 horses (69%) and poor body condition in 80 (17%). During oral examination, other clinical signs such as halitosis (2%), quidding (4%), long grass fibers or grain present in the faeces (7%) and mandible and/or maxilla swellings (1%) were observed.

During the oral soft tissues exam, 259 horses (56%) presented lacerations and/or ulcers, which were distributed as follows: 172 (38%) in oral mucosa of the cheeks, 70 (16%) in the bars of the mouth, 44 (10%) in commissures of lips, 6 (1%) in tongue, and 3 (1%) in soft palate.

The first premolar (Wolf teeth or triadan 05') was present in 147 (32%) horses, all of them in the maxilla. Blind wolf teeth were present in 20 (4%) horses, and fractured in 4 (1%) of them.

The canine teeth or triadan 04' was present in all of 288 males in the study group, and only in 5.3% (9) of 168 mares. The disorders founded (table 1) were tooth overlong (TO, "supererupted", or excessively tall) in 245 (56%), periodontal disease in 129 (28%), then fracture in 7 (2%) and apical infection in 5 (1%). The last one was confirmed by radiographs.

The most commonly identified incisor abnormality (Table 1) was malocclusion type 1 (TO, Tooth overlong, or excessively tall) in 147 (32%) horses, others problems were Ventral Curvature (VC, "smile bite") in 116 (25%) and dental abrasion in 57 (13%).

The most frequent cheek tooth disease (Table 1) was the presence of sharp enamel points (PTS, or "beaks") with 93% (mostly in maxillary arcade). Dental overgrowths or protrusions ("hooks") in 78% (the most affected teeth was 311, 411, 106 and 206), "ramps" in 51% (the most affected teeth was 306 and 406) and "steps" in 43% of the horses.

About the treatment applied Odontoplasty was performed in 99% of the studied horses, followed by wolf teeth extraction in 32% of them. Other treatments applied were extractions of retained dental caps (12%), periodontal flushing (4%), extraction of infected cheek teeth (1.5%) and crown restorations (1%).

Confidence intervals between all dental diseases individually and age or gender showed no statistical significance, which make them independent. When age groups were made, statistical significance appears when applying X² Pearson (p=0.01, n=456, X²=38.611), were mostly malocclusion type I was the more common in young, mature and geriatric horses. Other disorders such as problems at the time of eruption, development and periodontal disease are statistically similar X² (p=0.07, n=456, X² 4.322) in this sample of horses.

DISCUSSION

Soft tissue lesions are generally produced by malocclusion type 1 disorder (Klugh 2011a). Pimentel *et al* (2007) reported the presence of 1709 ulcers during oral examination in 607 horses of different breeds in oral mucosa near maxillary cheek teeth; also, 13.4% of those horses had lesions involving the tongue and 11% in the bars of the mouth. The differences relating to the lesions involving the tongue could be explained by the different bits used in Chilean rodeo horses, badly fitting bits or poor riding technique (Bennet 2006). The data suggests that a more individual approach to the choice and fitting of the bits would be a more effective procedure in Chile, as the use of a bit may be a high risk factor for the development of oral ulceration in Chilean rodeo horses.

It has been reported that the wolf teeth is present in about 15-80% of horses, mainly present in those younger than 2 years old (Easley 2011). Other reports showed that from 607 examined horses of different breeds, 20% of them had wolf teeth present in the maxilla and 8% hidden wolf teeth (Pimentel *et al* 2007). Differences have been described in Chilean rodeo horses, where 16% of them had wolf teeth (Muñoz *et al* 2010), while in thoroughbreds in Chile, 131 out of 160 (82%) had the first premolar present (Rivas *et al* 2006). It has been suggested that thoroughbreds have a higher frequency of presentation of wolf teeth because of their younger age at competition compared to Chilean horses, which more likely loose teeth 506 or 606, what could explain their lower presentation.

Canine teeth findings were in agreement with previous reports in horses, such as 80-100% in males and 7-30% in mares (Dixon *et al* 2005, Rawlinson 2011, Easley 2011) but different from what Muñoz *et al* (2010) reported in Chilean rodeo horses, where the canine was present in 77% of males and in 56% of female horses. In the same study, they reported the presence of hidden canine in 24% of the horses, which could be explained by the different protocols used in the examination as this situation could be considered normal in mares (Rawlinson 2011). Other studies reported the presence of canine teeth in 35% and 52% in thoroughbred horses and Chilean mix breeds respectively (Esturillo 2008, Estrada 2006). Similar results were observed by Easley (2011), Rawlinson (2011) and Caldwell (2006), as the canines tend to erupt continuously without wear because of the characteristic lack of occlusal contact that differs from the other horses mouth's teeth.

Incisor problems showed only 32% of the horses were affected. Nevertheless, there are previous reports in Chilean rodeo horses, where 84% of the horses presented this problem (Muñoz *et al* 2010), while Dixon *et al* (1999a) reported a frequency of 11% in a mix breed population. The overgrowth of the permanent incisors is usually small, and not greater than 3mm in length, mainly affecting the triadan 101 and 102. This disorder has been associated to box confinement and subsequent modification of the masticatory pattern, associated with the lack of pasture feeding (Dixon *et al* 2005), Pimentel *et al* 2007). The second most commonly identified incisor abnormality was ventral curvature in 25% of all studied animals, while it has been previously reported a wide variation in frequency (1-30%) for ventral and dorsal curvature (Peters *et al* 2006, Pimentel *et al* 2007). Less common abnormalities included developmental disorders such as brachygnathism in 17

(4%) horses, on the other hand no horses presented prognathism, similar data from what has been previously reported (Peters *et al* 2006, Pimentel *et al* 2007). Periodontal disease was found in 7% of the horses of the current study, less than what was reported by Muñoz *et al* (2010) were they found the presence of gingivitis in 11% of the horses and 32% with tartar. But it is important to mention that this last finding may be overrepresented because they consider as tartar the staining of cementum or dentin, which

most of the time does not have any clinical significance (Tremaine 2013). Dixon *et al* (1999b) reported the presence of 6.8% periodontal disease in incisors. This disorder is generally considered of low prevalence and is not clinically relevant, except when there is diastemata, which keeps food trapped within the interdental space between the incisors (Dixon 2011).

It's important to establish that molar problems are more frequent than in other teeth as previously described (Dixon *et al* 2000), reporting the presence of 87% of horses with primary affection of cheek teeth in a mix breed population, while Pimentel *et al* (2007) reported the presence of hooks in 50% (607) horses. Our results differ from Peters *et al* (2006) in 483 jumping horses that found 58% of sharp enamel points, 34% hooks, and Chinkangsadarn *et al* (2015) in 400 equine head cadavers mix breeds that found 55.3% of sharp enamel points and 43% of hooks. The higher prevalence in these malocclusions could be due to a special head conformation in the Chilean horse that is well known by his dorsal convexity and size, as well as higher consanguinity in genetic breeding.

Mild common abnormalities in other studies like rotated or absent teeth, as well as supernumerary or open pulp teeth (pulpitis) were not detected in this group of horses.

CONCLUSIONS

In the current study different oral and dental disorders present in Chilean horses were described. No differences in the presence of these disorders according to age or gender were found, which makes them independent. This results are in agreement with previous publications in horses, where it has been indicated that all dental diseases can be present at different ages (Dixon *et al* 1999ab, Chinkangsadarn *et al* 2015), although it can be noted that diseases such as periodontal disease could be present in older horses (not observed in the present study) or eruption abnormalities in younger horses. It was also observed that males and females present the same frequency of dental disorders. (Dixon *et al* 2005).

The major causes of dental abnormalities can be acquired, eruption, or developmental. And when these disorders are divided into age groups, it was noted that malocclusion type 1 is frequently found in young, mature and geriatric horses. The diseases at eruption, development, and periodontal disease were present within the same frequency in all the population; nevertheless, malocclusion type 1 abnormality was the most prevalent equine oral disorder in this group of horses.

This study shows that Chilean rodeo horses present similar dental disorders than other horse breeds. Nevertheless, there are small differences related to soft tissues lacerations and a high prevalence of malocclusions in incisors, which will further be studied.

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