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Vitiligo in equine: a four-year case study of a roan horse - case report

[*Vitiligo em equinos: um estudo de caso de quatro anos de um cavalo roan - relato de caso*]

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ABSTRACT

Vitiligo is a dermatological disease affecting both animals and humans. It is characterized by depigmented macules of varying shape and size, originated from melanocyte destruction. Even though there are some theories tackling causation, disease etiopathology is not yet certain. Moreover, lesion areas can either increase or diminish over time, and therefore, available treatment alternatives tend to prove inconsistencies. No epidemiological data or registered cases were found for equines in Brazil. The horse in this case description displayed depigmentation areas in facial regions, including upper lip, nose and lips. However, the individual did not happen to develop any systemic alteration. Through clinical evaluation, backed by a histopathological exam, a definitive vitiligo diagnosis was obtained. However, no therapeutic plan was stipulated. The animal was accompanied for four years, during which period some affected areas diminished while others increased in size. In addition, emergence of new skin lesions was also observed during the time the animal was studied. Overall, this disease does not display alterations to organism functionality, only aesthetic changes. Therefore, treatment plans may vary from case to case, occasionally being even ruled out.

Keywords**:** dermatology, depigmentation, skin, equine

RESUMO

O vitiligo é uma doença dermatológica que pode afetar animais e humanos. Caracteriza-se por áreas despigmentadas, de formas e tamanhos variáveis, que surgem devido a destruição dos melanócitos. Existem algumas teorias que tentam explicar a etiopatogenia da doença, entretanto ainda não é totalmente esclarecida. As lesões podem aumentar ou diminuir com o tempo, por isso os tratamentos disponíveis são inconsistentes. Não foram encontrados dados epidemiológicos ou relatos de vitiligo em cavalos no Brasil. O equino deste relato apresentava lesões despigmentadas na região da face, incluindo pálpebras, narina e lábios, sem alterações sistêmicas. Por meio da avaliação clínica em conjunto com o exame histopatológico obteve-se o diagnóstico definitivo de vitiligo. Não foi instituído nenhuma terapia, e o equino foi acompanhado durante quatro anos. Durante esse período algumas lesões diminuíram e outras aumentaram de tamanho sendo também observado o aparecimento de novas lesões. O vitiligo não traz alterações sistêmicas, apenas mudanças estéticas, por isso a escolha pelo tratamento dependerá de cada caso.

Palavras-chave: dermatologia, despigmentação, pele, cavalo

INTRODUCTION

Skin depigmentation is the main distinguished symptom of vitiligo, a non-contagious and uncommon disease affecting both animals and humans. It is characterized by full or partial destruction of melanocytes in the epidermis and associated hair follicles, leading to the formation of white prominent spots on the surface. Frequent sites where the disease can manifest include perennial, genital, and facial areas, especially nose, around the eyes and lip surroundings (Scott and Miller, 2011).

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Independently of the targeted organism, disease etiopathology is not completely clear. Three possible theories are discussed when it comes to the pathogenic mechanism of action: (i) hereditary inheritance, (ii) acquired disease, and (iii) autoimmune origin (Naughton *et al*., 1986; Bergero, 2012).

In humans, 0.5 - 1% of the global population bear this condition. In contrast, there is little to no data regarding horses. Nevertheless, a clinic in the United States has reported 0.7% disease prevalence for diagnosed equines (Taieb *et al*., 2013; Scott and Miller, 2011). Even so, no data reports were found in Brazil, implying the possibility of diagnostic mistakes, which in turn highlights the importance of describing relevant circumstances such as the respective case detailed in this paper.

CASUISTRY

In this study we report the case of an 18-year-old castrated crossbreed male roan-haired horse weighing 340 kg. The horse took part in a program called Cart Horse Friend Extension Program (PAC - Programa de Extensão Amigo do Carroceiro) of the Agricultural and Veterinary Sciences Center (CAV - Centro de Ciências Agroveterinárias) in Santa Catarina State University (UDESC - Universidade do Estado de Santa Catarina) and was attended at the Veterinary Clinics Hospital (HCV - Hospital de Clínicas Veterinárias). Depigmented regions were observed on the animal's face throughout routine clinical examination.

The horse owner had acquired the animal 30 days beforehand and could not inform about the emergence and development of lesions. The animal in concern is employed for cart traction in order to collect recycable materials for three hours daily, seven days a week. After working hours, the animal remained loose on a paddock with common grass. The program provided commercial rations and mineral salt, the first of which was given in a ratio of 1 kg per 100 kg of live weight divided in two portions a day. Vaccination schedules were performed using trivalent vaccine (tetanus, influenza and encephalomyelitis) and deworming schedules were carried out administering oral ivermectin paste according to copro-parasitological exam results as described by Gordon and Whitlock (1939).

Physical examination showed a heart rate of 49 bpm (tachycardia), respiratory rate of 36 bpm (tachypnea), pink mucous membranes, capillary refill time - CRT of 2 seconds, a 37ºC rectal temperature and normokinetic pulse. The presence of irregularly shaped depigmentation areas was observed in the bilateral upper lip, nostrils, and in the bilateral periocular region (Figures 1A, 2A and 3A). The lesions ranged from approximately 0.5cm to 4cm in diameter. Lesions were characterized by leukodermic areas of varying sizes, without pruritus and with no scabs or secretions. In addition to tachycardia and tachypnea, which may have struck due to agitation, no further changes were observed for other variables of the physical examination.

Four skin fragments from the depigmented patches were collected for biopsy by using an 8mm punch after sedating the animal with intravenous detomidine at a dose of 20µg/kg. The material was packed in 10% buffered formalin and sent to Animal Pathology Laboratory for histopathological examination. Samples were prepared with Hematoxylin and Eosin (HE) staining for subsequent evaluation under optical microscopy. The four skin fragments analyzed showed significant hypopigmentation of the epidermal basal layer, due to complete absence of epidermal melanocytes. Moreover, lesion areas displayed a moderate amount of melanin-filled melanomacrophages on the superficial layers of the dermis, suggesting a clinical diagnosis of vitiligo (Figure 4).

For this clinical case, no treatment was carried out, and the equine in question was simply monitored for four years. During the disease course, there was a reduction in the patches on the left periocular region and left upper lip (Figure 1B and 3B). However, a new depigmented area, approximately 2cm in diameter appeared on the left circular lower lip (Figure 3B). In addition, there was an increase on the right upper lip patches (Figure 2B).

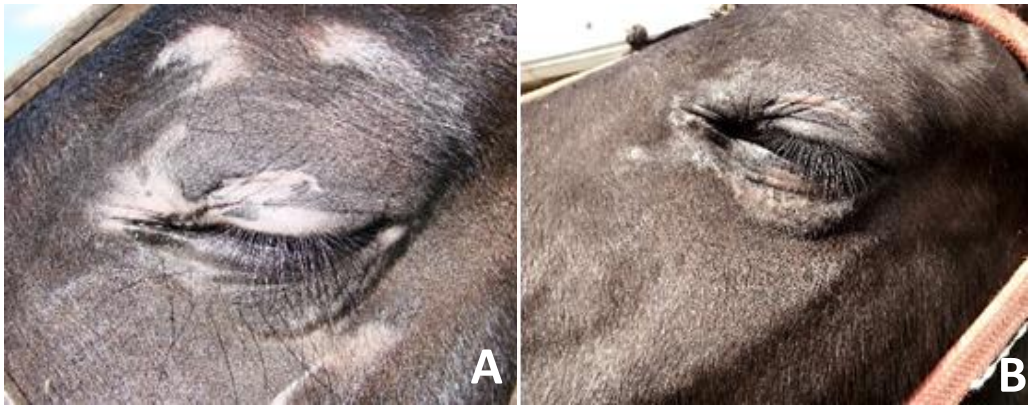

Figure 1. Male, 18-year-old gelding crossbreed roan-haired horse, with depigmented patches of approximately 3cm on the left periocular region, in 2014 (A) and decreased patches after four years, in 2018 (B).

Figure 2. Male, 18-year-old gelding crossbreed roan-haired horse, with multiple small depigmented patches on the right upper and lower lip region, in 2014 (A) and regression of small patches and appearance of a circular lesion of approximately 2cm in diameter on the right upper lip after four years, in 2018 (B).

Figure 3. Male, 18-year-old gelding crossbreed roan-haired horse, with small depigmented patches ranging around 0.5cm in diameter on the upper left lip region, in 2014 (A) and development of a patch approximately 2cm in diameter on the lower left lip after four years, in 2018 (B).

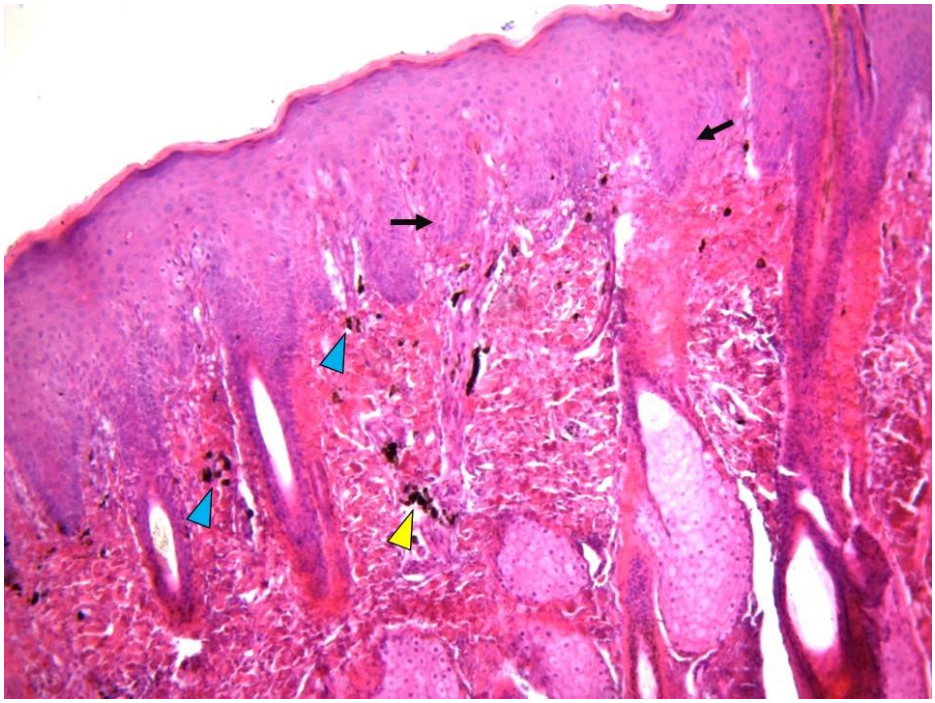

Figure 4. Histopathological aspect of the equine lip diagnosed with vitiligo. Diffuse and pronounced hypopigmentation of the epidermal basal layer (arrows), associated to discrete pigment retention (blue arrowhead) and evidence of multiple melanin-filled melanomacrophages (yellow arrowhead) on the dermal superficial layers (HE, 100x).

DISCUSSION

There is much speculation regarding vitiligo etiopathology, some theories have been proposed and it is believed that it may be multifactorial. Genetic modifications make melanocytes more susceptible to environmental and nutritional factors, which cause the destruction of these cells (Bergero, 2012). In addition to the autoimmune theory, in which specific antibodies against pigment cell antigens have already been found, and the autotoxicity theory (Naughton *et al*., 1986). However, due to these characteristics, and the lack of information about the horse's history, it was not possible to state the etiology of this case.

Vitiligo has a genetic correlation with melanoma, a malignant neoplasm that affects melanocytes. Both occur most often in gray coat horses, and this relationship with the color of the coat indicates that there is a inheritance component in vitiligo (Curik *et al*., 2003), and that it may be related to the case reported, as the horse has brownish-grey coat, a variation of the gray coat. In addition, bleaching in gray horses is common with advancing age, and is related to an autosomal dominant trait, associated with a high incidence of melanoma and vitiligo. This information corroborates the higher incidence of these changes in older horses (Pielberg *et al*., 2008). But any age can be affected, from foals from one to two years old and in geriatric horses, as in this report.

There was a correlation between the degrees of melanoma and vitiligo in the perianal region, but not in the facial region, which may explain the absence of characteristic lesions of melanoma in the horses in this reported, even though there is a correlation between them, since the depigmented lesions were found only on the face (Hofmanova *et al*., 2015). Lerner and Cage (1974) described that vitiligo can precede melanoma in horses and in humans, which highlights the importance of follow-up in these cases, as performed in the present report.

Depigmentation is the characteristic clinical sign of vitiligo, resulting from the destruction of melanocytes, responsible for skin pigmentation. The disease is characterized by the appearance of

bleached areas, which develop over time, which may increase in size and number, and / or regress. A giraffe with vitiligo lesions was observed for six years, and the lesions increased over time. No treatment was cariied out, and the depigmented area that began in the proximal region of the neck, at the end of the observation period, extended to the full neck (Muller, 2017). This case differs from what was seen in the equine here described, in which the behavior of the lesions was different, as some regressed and new depigmented areas emerged.

Tachycardia and tachypnea were the only changes on physical examination, which may be associated with agitation. The other parameters were within the normal range, and there were no further changes in the dermatological examination. These results agree with a research carried out by Bergero (2012), in which systemic changes, or other skin lesions, are generally not observed in horses with vitiligo. Accordingly, the diagnosis in this case study, based on clinical presentation and backed up by histopathology, showed depigmented areas without systemic or other skin changes.

Differential diagnosis includes diseases that cause leukoderma, such as lupus erythematosus, which is characterized by depigmented areas in similar locations to those of vitiligo. However, in lupus erythematosus, in addition to areas without pigmentation, there is also alopecia in the shapes of scars, erythema and scaling, which may have systemic involvement (Scott; Miller, 2011), signs not shown by the patient in the report. There is no effective treatment for vitiligo, but due to the probable relationship with nutritional changes, the use of supplementation has shown some positive results in reducing depigmented areas (Bergero, 2012).

For although the diet should provide all the necessary nutrients for maintaining the integrity of the skin and coat, horses with vitiligo have greater nutritional needs. The main elements involved are vitamins A and B complex, and minerals. Among minerals, copper is the most important, as its function is related to the production of melanin, and deficiency causes depigmentation (Bergero, 2012). Copper supplementation reduced some lesions in an Arabian foal, however after treatment was discontinued, depigmentation areas returned (McLean; Jones, 1983). Treatment with the commercial compound Clovite® (Fort Dodge Animal Health, Fort Dodge, IA), which contains vitamins, minerals and amino acids can be an alternative treatment, with a proven result (Montes *et al*., 2008).

The topical and systemic application of corticosteroids, such as triamcinolone, is also prescribed for more extensive cases (Montes, 2006). In human, studies with clobetasol have shown beneficial effects. Furthermore, tacrolimos, an immunosuppressive agent, had positive effects in the treatment of vitiligo in children (Lepe *et al.*, 2003). The association of tacrolimos with ultraviolet radiation seems to play a synergistic role in the repigmentation of lesions (Taieb *et al*., 2013). Although, they are treatments used in humans, but they can become a viable alternative for horses.

However, due to the behavior of the lesions to increase and decrease, or to remain unchanged as described in the report, it makes the benefit of diet and other treatments inconsistent, and of difficult interpretation about its results. Some authors report no benefits at all when it comes to recommended treatments (Scott and Miller, 2011). Due to this information, it was decided not to institute any treatment and to accompany this horse for four years. In the evaluated period, there was a decrease in some injuries, and the appearance of others, but they are non-generalized depigmented areas, and without systemic involvement.

CONCLUSION

Vitiligo is an easy to diagnose disease due to the distinctly visible dermatological lesions, which can be straight forwardly backed up by a histopathological exam. During the course of the disease, lesions can either increase or diminish in size. Furthermore, the appearance of new depigmented regions is also expected. Even though this condition does not influence the animal systemically, it can interfere in its commercial value.

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