

Epidemiological study on wound distribution pattern in horses presented at two veterinary clinics in south west, Nigeria between 2007- 2010

Abstract

A wound is a breakdown in the protective function of the skin or loss of continuity of epithelium, with or without loss of underlying connective tissues, muscles, nerves, bones following injury to the skin. Wound healing is a survival mechanism and represents an attempt to maintain the normal structure and function. The capacity of a wound to heal depends partly on its depth, overall health, area of the body and nutritional status of the individual. This study presents an epidemiological survey of wounds on different parts of the body in horse presented at state veterinary hospital and Polo club, Ibadan, Nigeria. The data generated were analyzed demographically using descriptive statistics. Out of the total of 84 horses presented for wound cases at State veterinary clinic within this period, wound on the limbs had the highest prevalence of 57%(48), followed by wound on the head and neck with 21%(21), wound on the trunk with 11%(9) while the least prevalent was the wound on the udder with 7%(6). Wound on the leg was the most prevalent condition with 94.2%(389horses), followed by wound on the head and neck with 2.9%(12), wound on the body with 2.4%(10) while wound on the underbelly was the least prevalent with 0.5%(2) out of the total of 413 horses presented at polo club, Ibadan. Limb wounds are often the most challenging to manage and commonly develop complications, such as the formation of exuberant granulation tissue that will prolong treatment, increase cost and worsen the prognosis.

Keywords: wound, horses, leg, head, neck

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Introduction

A wound is defined as damage or disruption to the normal anatomical structure and function.¹ This can range from a simple break in the epithelial integrity of the skin or it can be deeper, extending into subcutaneous tissue with damage to other structures such as tendons, muscles, vessels, nerves, parenchymal organs and even bone.²

In everyday pathology, wounds remain a challenging clinical problem, with early and late complications presenting a frequent cause of morbidity and mortality.³ Wounds can be classified according to various criteria¹ which can be clinically categorized as acute and chronic according to their time frame of healing.⁴ Healing time varies depending on the type of injury and the extent of tissue loss. Superficial wounds with only epithelial tissue damage require relatively short intervals to heal, but deep wounds with damaged blood vessels require longer time and more complex processes.⁵ Other criteria taken into account during wound classification include aetiology, degree of contamination, morphological characteristics and communication with hollow or solid organs.⁶ Wounds may also be referred to as closed, where the underlying tissue has been traumatized but the skin has not been severed, or as open, where the skin layer has been damaged with the underlying tissue exposed.⁷ Once the protective barrier is broken, the normal physiological process of wound healing is immediately set in motion.⁸

Wound healing is a complex biological process consisting of hemostasis, inflammation, proliferation, and remodeling (Gosain and DiPietro, 2004, Shai and Maibach, 2005). It involves large numbers of cell types—including neutrophils, macrophages, lymphocytes, keratinocytes, fibroblasts, and endothelial cell (Head, 2007).

Horses have been utilized by mankind for thousands of years for a variety of purposes such as the provision of food, leather, milk and therapeutics; beasts of burden to support farm production, transportation and military purposes; and for recreation. In more recent times and with changing human population dynamics, economic circumstance and selective horse breeding, horses are found throughout the world. The global horse population is estimated at 58Million⁹ with 60% of this population being working horses found mainly in developing countries,¹⁰ with a significant proportion of the remainder used in the growing racing, equestrian and recreation industries. Horses are powerful and frequently unpredictable animals, capable of moving at high speeds and of generating great force with a single kick.^{11,12}

The horse industry plays an important part in the national economy and agriculture in many countries. Business opportunities for entrepreneurs include feed, equipment, livery stables, training of horses and riders in equestrian sport, and various veterinary and other equine health care services. The biggest turnover meanwhile is in the horse racing industry including betting on horses, that in turn affects the whole society as tax income from betting finance other sectors of the economy. Nigeria has about 200,000 horse population.^{9,13} Horses are accorded special attention due to the immense role they play in polo games, cultural festivals and security.¹⁴ Nigeria equestrian industries are fast growing and horses now travel for both local and international competitions particularly horse racing, polo tournaments and durbar. Moreover, it is desirable to have a retrospective knowledge on wound occurrence on different parts of the body of horses for preventive measures to be taken and in order to sustain and enhance the socio-economic benefits the horse industries provide. Therefore, this study

is to establish the trends in the occurrence of wounds in horses and to provide an epidemiological survey data base for reference purposes.

Materials and methods

The study was conducted by collecting clinical records of all diagnosed and confirmed cases of wound in horses presented to the State Veterinary Hospital, Ibadan and Polo Club, Ibadan from 2007–2010. The data generated were analyzed demographically using descriptive statistics such as percentages and frequency (Gomez and Gomez, 1984).

Results

The result revealed that out of the total of 84 horses presented for wound cases within this period, wound on the limbs had the highest prevalence of 57%(48), followed by wound on the head and neck with 21%(21), wound on the trunk with 11%(9) while the least prevalent was the wound on the udder with 7%(6) (Table 1 & 2).

Table 1 Summary of the prevalence wound cases in horses brought to the state veterinary Hospital, Mokola, Ibadan, Nigeria, from January 2007-December 2010

Wounds on different parts of the body	Number of cases	Prevalence (%)
Head & Neck	21	25
Trunk	9	11
Limb	48	57
Udder	6	7
Total	84	100

Table 2 Summary of the prevalence wound cases in horses brought to polo club, Ibadan, Nigeria, from January 2007-December 2010

Wounds on different parts of the body	Number of cases	Prevalence (%)
Head & Neck	12	2.9
Leg	389	94.2
Body	10	2.4
underbelly	2	0.5
Total	413	100

Wound on the leg was the most prevalent condition with 94.2%(389 horses), followed by wound on the head and neck with 2.9%(12), wound on the body with 2.4%(10) while wound on the underbelly was the least prevalent with 0.5%(2) out of the total of 413 horses presented.

Of the 24 wound cases encountered in goats within the study period, leg wound occurred most with 17 cases(70.83%) followed by body with 3(12.5%), head and neck with 3 cases each(8.33%). Of the 34 wound cases encountered in sheep within the study period, leg wound occurred most with 21 cases(61.76%) followed by body with 6(17.65%), head with 4(11.76%) and neck with 3 cases(8.82%).

Discussion and conclusion

More than 72% of the world's horse population is found in developing countries specifically kept for draft purpose.^{15,16} A wide

variety of wounds involving the neck and body are encountered in horses, and many of the factors contributing to the high incidence of these injuries are related to the nature and the use of the horse. As a “flight” animal, the horse often reacts to frightening circumstances by running into objects(e.g., a wooden post or fence, barbed wire). Additionally, horses housed on premises that are not properly maintained(e.g., protruding nails, broken boards, broken tin sheds) are at a greater risk of injury. Because the horse's skin is relatively thin, impact with objects commonly leads to large skin wounds.

Generally, wounds to the body are less contaminated than those to the distal aspect of the limb and thus possibly more amenable to primary closure. However, complete closure of a wound on the body, while desirable, often is not possible because tissue is lost, retracted, nonviable, or adjacent to other lacerations, or because the wound is located in an area of high motion where protection of the repair from tension is difficult. Fortunately, wounds of the body contract more rapidly and to a greater degree than do wounds of the distal aspect of the limb.¹⁷

Although there may be geographic differences in terms of type and incidence of wounds encountered, wounds of the distal aspect of the limb(i.e., up to and including the carpus and tarsus) of horses are quite common and account for more than 60% of all wounds¹⁸ which agrees with the result of this study. Sharp objects, such as sheet metal, broken glass, exposed nails or bolts, and barbed wire, are responsible for most lacerations and avulsion injuries, but serious wounds can be caused by smooth, high-tensile wire or by rope. Protruding objects, such as stubs of wood projecting from tree trunks or logs, or nails and bolts protruding from fences, buildings, or trailers, are often the cause of penetrating wounds. Wounds involving the distal aspect of the limb are often more problematic than wounds located elsewhere because their close proximity to the ground makes them more likely to become contaminated, and because skin in the distal portion of the limb is less vascular than skin located elsewhere.

Wounds of the distal aspect of the limb increase in size during the first 11-16days after trauma, whereas those on the body change little in size.^{19,20} Although one study showed that wounds of the distal aspect of the limb of horses epithelialized more slowly than did wounds on the thorax or flank.²¹ The greatest difference in the rate of healing of wounds involving the body and those involving the distal limb is the greater contribution of contraction to the healing of wounds on the body.²² Wounds that heal by contraction produce a more cosmetic outcome than those that heal by epithelialization because, with contraction, all layers of skin, including cutaneous adnexa(i.e., hair follicles, sebaceous and sweat glands), are carried centripetally(i.e., toward the center). In addition, Olaifa & Adeyemi²⁰ reported the rate of wound healing in different parts of the body of the West African Dwarf goat and concluded that wounds on the trunk and head healed faster than those on the thigh/leg because: the circulation to the limb is poor, the trunk and head have better blood supply; of constant or regular joint movement in the limb; there's minimal soft tissue between skin and bone of the limb; the limb has greater risk of contamination as it is closest to the ground and animal makes contact with the ground through the limb when lying down.

Limb wounds are often the most challenging to manage and commonly develop complications, such as the formation of exuberant granulation tissue that will prolong treatment, increase cost and worsen the prognosis.²³ The study of problematic healing of skin wounds on the limbs of horses has provided valuable information on

some of the mechanisms underlying this phenomenon. For example, the inflammatory response to wounding in horses is weak,^{17,22} which may be the result of a state of tissue hypoxia present in limb wounds^{24,25} consequent to occlusion of the micro vessels within the wound bed.^{26,27}

Conclusion

In conclusion, wound healing at the extremities of horses present a special clinical problem and also in other animal species because of the anatomical peculiarities of the limb and the proximity to the ground. However, there is need to develop a special protocol to tackle the problem of wound healing in the horse since they are immensely relevant to the economy and recreational atmosphere of any nation.

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Conflict of interest

Author declares that there is no conflict of interest.

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