INJURIES OF LIMB JOINTS DURING RACE TRAINING OF TWO-YEAR-OLD THOROUGHBRED HORSES

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Abstract

The research material consisted of 850 two-year-old Thoroughbred horses of both sexes representing Polish breeding. The animals came to Race Track in Służewiec to participate in trainings. The animals were observed for the incidence of trauma during the period of four years: from the middle of December 1985 to the end of December 1989. On the basis of the observations, leg injuries were recognised in 513 (60.4%) horses. Total number of injuries was 861 (some horses were injured more than once). In cases of pathologic changes observed in legs or limp, the animals were subjected to detailed orthopaedic examination in Służewiec Horse Hospital in Warsaw. In most cases radiological images were taken to confirm the diagnosis. The fetlock joints were the ones, which were most frequently injured in the horses examined. The incidence of trauma was high and constituted almost half of all the recognised injuries.

Key words: racehorses, training, limb injuries.

Diseases of limb joints in animals can be divided into: growth disorders, diseases caused by injuries, sensu lato joint inflammation (arthritis) and joint distortion also called arthrosis (12).

Among various species of domestic and farm animals, developmental disorders of joints are a very important problem in dogs. Farm animals are rarely affected by these disorders. As far as fattening cattle and pigs are concerned, these disorders are the result of disproportion between the skeleton resistance and fast growth of body weight and they appear as an epiphysis separation (epiphysiolysis) and apophysis. Only a few similar cases were observed in horses and they occurred only in foals of cold-blooded breeds (12).

Diseases caused by injuries include: contusion, distorsion, and dislocation. A joint can also be recognised as twisted when the joint capsule is prominent and slightly torn, with a partial or total break of the ligament of the joint. A dislocated joint means that a joint ligament and a joint capsule are partly or totally broken and this is accompanied with bleeding to the joint cavity and periarticular tissues. At the same time there is a permanent change of location of the joint bone surfaces. In the case of joint contusion, there are joint cartilages damaged and fissures appear. Fissures can occur in the area of the bone end-plate or in the spongious substance adjacent to it (12).

Joint inflammations in animals, according to their pathogenesis, can be divided into aseptic inflammations and those caused by infection. The former are the result of closed injuries. Septic inflammation occurs because of the wounding, when the joint cavity becomes open and when inflammation process develops from nearby soft tissues or bone marrow of the bone epiphysis. The inflammations caused by bacteremia or metastases are very seldom.

If the inflammation is chronic and causes deforming changes in the joint, it leads to joint degeneration. Sometimes a considerable loss of joint cartilage exposes the bone end-plate, which leads to fusing of the adjacent joint areas and finally to ankylosis of the joint (9, 12).

The main aim of the conducted research was to estimate the incidence of traumas of limb joints in two-year-old Thoroughbred horses, which took part in race trainings. The main aim required realisation of smaller goals, which were as follows: determining kinds of joint illnesses appearing most frequently in a given population, determining joints, which are most often injured, and observing the incidence of diseases of limb joints depending on the month of the year.

Material and Methods

The research material consisted of 850 two-year-old Thoroughbred horses of both sexes,
monitoring was from the 15th December of the year they standardise the observation period, the total time of December 1985 to the end of December 1989. To locomotor system in general incidence of trauma diseases concerning particular structures of the examinations of the horses, the case analysis was and SIEMENS POLYMOBIL /90 kV, 80 mA/ radiographic images were taken to establish or to according to the type of pathology and the injured joints.

The animals were observed for the incidence of trauma during the period of 4 years: from the middle of December 1985 to the end of December 1989. To standardise the observation period, the total time of monitoring was from the 15th December of the year they came to trainings to the end of December of the next year. In cases of limp or pathologic changes observed in legs, the animals were subjected to detailed orthopaedic examination in Służewiec Horse Hospital. In most cases radiographic images were taken to establish or to confirm clinical diagnosis. ARMAN I /75kV, 18 mA/ and SIEMENS POLYMOBIL /90 kV, 80 mA/ apparatuses with FOTON XS-1 NIF plate were used. On the basis of the achieved results of the orthopaedic examinations of the horses, the case analysis was conducted.

Firstly, we analysed the participation of leg diseases concerning particular structures of the locomotor system in general incidence of trauma taking into account the following structures: muscles, tendons, ligaments, joints, bones, soft tissues, and hoof structures.

Secondly, the recognised leg joint diseases were analysed. Cases of joint diseases were divided according to the type of pathology and the injured joints. The kinds of pathologic states were analysed in the following categories: joint inflammation-arthritis, ankylosis, arthrosis, dislocation, and distorsion.

To make the matters clear, it is necessary to add that in the conducted research when the contusion referred only to the soft tissues in relation to a given joint (no changes were observed in the joint itself), the illness was classified as an injury to the soft tissues. Whereas, as a result of force (pushing, pressing, overloading or strike), the joint itself was damaged and there were also damages to the joint cartilages and bone end-plate or the spongious substance adjacent to it, then the injury was classified as aseptic arthritis, which was the direct consequence of joint contusion. The similar activities concerned situations in which there was inflammation of the joint with other injuries existing. When there was a tear or a total break of the joint cavity or joint ligaments, the case was classified as dislocation or distorsion.

The injured joint was also determined taking into account the following joints: humeral, ulnar, carpal, hip, knee (genu), tarsal, metacarpo- and metatarso-phalangeal and fetlock, proximal metaphalangeal (in thoracic and pelvic limbs), and distal metaphalangeal (in thoracic and pelvic limbs/the hoof joint).

Finally, the frequency of joint injuries was analysed in given months of the first year of training.

Results and Discussion

On the basis of the observations of the horses undergoing race training, leg injuries were recognised in 513 (60.4%) horses. Total number of injuries was 861 (some horses were injured more than once) (4). Out of these injuries, 232 were recognised as those, which occurred to muscles, ligaments, and tendons, 214 joint diseases, 176 consequences of injuries to the soft tissues (skin/cutis, subcutaneous tissue), such as contusions, wounds, haematomas or abscesses, 148 cases of bone diseases, and 80 cases of disease of hoof structures. Eleven horses had motor ataxia or no disease was found (Fig.1).

Dividing all the injuries depending on the kind of the joint injury, the most frequent one was arthritis (179 cases). There were also 11 cases of ankylosis, 10 cases of arthrosis, 8 of luxation, and 6 of distorsion (Fig. 2).

Mason and Bourke (7) examined all the injuries of given elements of the musculoskeletal system of 74 two-year-old Thoroughbred horses. They achieved similar results. They came to the conclusion that the most frequent joint illness appeared to be so called bucked shins and then arthritis. According to other authors, the injuries of joint cartilages are the most frequent cause of horse disability as far as injuries of muscular-skeletal system was concerned (3).

Among all leg injuries, those of the fetlock joint were the most common (Fig. 3). Ninety-one cases of them were recognised in both thoracic and pelvic limbs. Then, there were other injuries as follows: 38 – the carpal joint, 31 – the tarsal joint, 11 – the knee (genu) joint, 7 – the hip joint, 4 – the proximal metaphalangeal joint, and 2 – the ulnar joint. There was also 1 case of humeral joint, and one of the fetlock joint injury (Fig. 4).

The high percentage of the incidence of trauma of distal legs can be explained that the proximal joints are surrounded by a huge mass of muscles, which stabilises them. The distal joints lack this stabilisation (1, 2).

Here, the joint capsule and ligaments play this role during the movements. The ligaments are particularly exposed to injuries (5, 8, 11, 13).

In the conducted research, the areas of joint injuries in the horses were analysed in the following months of the first training year. It turned out that most injuries occurred between June and October, particularly in June, and between August and October (the beginning of racing season for two–year horses) (Fig. 4). The risk of joint injuries is increased by the exhaustion, which is the result of the participation in races. Research conducted in humans showed that joints can be only a little worn out even in 80-year-old people when they are not abused (12).
Fig. 1. Percentage of diseases concerning given structures of total leg injuries: muscles, tendons and ligaments (1), joints (2), bones (3), soft tissues, skin and subcutaneous tissue (4), hoof structure (5), ataxia or unrecognised (6).

Fig. 2. Percentage of injuries in total incidence of trauma: arthritis (1), ankylosis (2), arthrosis (3), dislocation (4), and distortion (5).

Fig. 3. Percentage of injuries of a given leg joints in total incidence of joint trauma: the fetlock joint (1), the carpal joint (2), the tarsal joint (3), the knee (genu) joint (4), the hip joint (5), the proximal metaphalangeal joint (6), the ulnar joint (7), the humeral joint (8), and the hoof joint (9).
Fig. 4. Injuries to the joints of the Thoroughbred horses depending on the month of the year.

Joints are extremely sensitive to stroke loading, which occurs during a fast movement, for example, when horses are galloping during the race. The energy connected with galloping is partly dispersed in bones and muscles; however, most of it is transmitted to the joint surface (6, 13).

On the basis of the achieved results and conducted comparisons and analyses, it is possible to conclude that:

- the analysis of illness occurrence concerning chosen structures in total incidence of limb trauma shows that muscles, tendons, ligaments, and joints are very prone to injuries.
- among all joints diseases in two-year-old Thoroughbred horses, joint inflammation was the most frequent, ankylosis, arthrosis, luxation, and distortions followed.
- the fetlock joints were the ones, which were most frequently injured in the horses examined. The incidence of trauma was high and constituted almost half of all the recognised injuries.
- the increased number of limb joint injuries between June and October (racing season for two-year-old Thoroughbred horses) shows that the extreme exhaustion after participation in races has an essential influence on the increase in the incidence of trauma of joint injuries of two-year-old Thoroughbred horses.

References