THE BIODIVERSITY OF MUSCULAR LYMPH NODES IN THE PELVIC LIMB AT HAMSTERS

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Abstract

The highlighting of the muscular lymph nodes in the pelvine limb was done by injecting the coloured substance intradermically. The coloured substance used was China Ink 40%, and the dose inoculated in the plantar pad was of approximately 0.1 ml. The injected solution locally formed an intradermic button. Injection purposes was to obtain a contrast between lymph nodes and lymph vessels (which retain or contain the coloured substance) compared with adjacent regions. After the animals were sacrificed, they were dissected by conventional methods. It was harvested the subiliac lymph node from the flank region, in order to identify their histological structure. By using the technique of innoculating coloured substance, highlighting ileofemoral lymph nodes, the popliteal lymph node, the superficial and profound inguinal lymph nodes and the subiliac lymph nodes was made possible. For the histological examination a Nikon AFX-DX, Labophot 2, with an automatic exposure photographing device, controlled computerisedly was used. In the subcapsulary sinus of the subiliac lymph node a numerous cell population can be noticed, represented by macrophagi and reticulary cells.

Key words: hamster, lymph node, coloured substance.

INTRODUCTION

Knowing the lymphatic system in hamsters is necessary due to these animals being used as lab subjects, which imposes clinical examinations as well as medicine testing, and tracking local and general responses of the organism.

The lymphatic system includes a rich network of confluent lymphatic vessels, with their origins in capillaries throughout the body and whose last collecting branches deverse in the greater veins, located on the cranial side of the thorax.

The lymph nodes of the pelvine limb in hamsters respect the morphotopography of those existent in other domesticated mammals, though some particularities can be observed. For instance, muscular relatively low volume is correlated to an approximate change in the lymph nodes’ topography and morphology.

Due to the aforementioned issues the current work includes describing the lymphatic centers morphotopographically and microscopically at the pelvic limb in hamsters, completing the already existent data base in specialty literature.

MATERIALS AND METHODS

In the present work 8 adult hamsters of both sexes were used. These animals were kept under observation for 24 hours.

In order to highlight the lymph nodes and lymphatic vessels of the pelvine limb the coloured substance China Ink 40% was injected. This solution has to have been filtrated through filter paper fixed in an airtight glass funnel set on a Berzelius container. 0.5 ml of coloured substance were injected with atraumatic needles in the plantar pad until an intradermic button was formed. The sacrificing of the injected animals was done one hour after they were inoculated, using the method of profound anaesthesia with etilic aether.

The histological study of the subiliac lymphatic center was done by colouring the samples with the hematoxilin-eosyne, methylene blue colouring method.

The prelevated samples were set in formaldehyde 10%, and in order to include the sample paraffin was used, thermostating it at 56 degrees for 2 hours. The paraffine blovks were...
sectioned using the microtome, and the sections were placed on plates for their histological examination. The obtained data was manufactured by computer, and their examination was done with the Nikon Labophot 2 microscope. Histological samples were studied using coloration hematoxilin-eosin and methylene blue. Permanent microscopic preparations were prepared. Their examination was performed with Labophot Nikon type 2. After sampling fragments were fixed in formalin 10% were plugged in containers glass, opaque glass stopper with a flat base, which contained a volume of 10% formalin 100 times higher than the volume harvested fragment. It was performed on paraffin inclusion of samples. To obtain fragments paraffin blocks they were maintained at room temperature for two days. Paraffin blocks were sectioned by microtome the resulting the fragments with a thickness of 4-6 μm. In this way sections were obtained in "ribbon" that were glued on glass slides. These blades have passed through container filled with coloring substances.

RESULTS AND DISCUSSIONS

The inguino-femoral lymphatic center is represented by the superficial inguinal lymph nodes (scrotal in males and retromammary in females) and the subiliac lymph nodes. The subiliac lymph nodes are represented by a solitary lymph node, placed on the superior border of the tensor fascia latae muscle on the trajectory of the descendental branch of the deep circumflex iliac artery. This lymph node can be palpated transcutaneously. It is ovoidal-shaped, with a length of approximately 2 mm and a width of approximately 1 mm (Fig. 1).

The afferent lymphatic vessels originate from the lateral side of the walls of the abdominal cavity and the lateral side of the calf. The efferent lymphatic vessels are tributary to the lateral iliac lymph nodes. The inguinal lymph nodes have a tributary territory which is different according to sex. In males there are two lymph nodes near the superficial inguinal ring. In females, there are two to three lymph nodes placed below the last inguinal mammary gland.

These lymph nodes constantly appear caught within a considerable amount of fat tissue. Their shape is oval, with a diameter of approximately 2 mm. The afferent lymphatic vessels of the scrotal lymph nodes originate from the foreskin, scrotal bags, penis and ventral abdominal wall. The efferent lymphatic vessels of the retromammarjan lymph nodes originate from the glandulary parenchyma, the mamelon and the perineal region (Fig. 2).

In both sexes, the efferent lymphatic vessels are tributary to the medial iliac lymph nodes and the ileofemoral lymph nodes. The profound inguinal lymphatic center is represented by the ileofemoral lymph nodes. In this species there is only one lymph node with a dimension of approximately 1,5 mm in diameter on the trajectory of the femoral artery in the femoral trigone.
The afferent lymphatic vessels originate from the medial side of the autopodium. The efferent lymphatic vessels are tributary to the medial iliac lymph nodes.
The popliteal lymphatic center is represented by the popliteal lymph node situated in the popliteal region. This lymph node is placed on the trajectory of the caudal femoral artery. The afferent lymphatic vessels originate on the lateral side of the calf. The efferent lymphatic vessels are tributary to the ileofemoral lymph nodes.
In the subcapsular sinus of the subiliac lymph node there are macrophagi, reticulary cells and lymphocites. A lymphatic vessel which opens in the subcapsular sinus was also noticed (Fig. 3).

By studying subiliac lymph under 100 x lens, in subcapsular sinus was identified a large cell population represented by reticular cells and macrophage (Fig. 4).

Also, it can be seen in the lymphatic sinus subcapsular this lymph node macrophage cells. In subcapsular sinus of the subiliac lymph node using 100x objective and they could detect lymphocytes (Fig. 5).

CONCLUSIONS

The popliteal lymphatic center is placed on the trajectory of the caudal femoral artery having a dimension of approximately 1.5 mm in diameter. Superficial inguinal lymph nodes can be palpated transcutaneously in both sexes. Ischiatic lymph nodes were unapproachable in hamsters.
The lymph nodes have, in their cortical region, lymphoid follicles pushed towards the middle portion of the lymphatic center. The subcapsular sinus is considerably large, having a numerous lymphocite population. At the medular coordinates and sinuses alike, dendritic cells, lymphocytes, reticualary cells and eosynocytes can be found.

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REFERENCES


ETIO-PATHOGENESIS OF SMALL RUMINANT LENTIVIRUS INFECTIONS: A CRITICAL REVIEW

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Abstract

RLVs are retroviruses belonging to the genus Lentivirus (subfamily Orthoretrovirinae). The earliest report of a disease whose pathological pattern suggest the SRLV infection was in Nederland, in 1862. Since then, several reports of clinical cases and scientific research, proved the wide dissemination of SRLV infections (Maedi-Visna in sheep and Caprine Arthritis-Encephalitis in goats) throughout all countries with large number of sheep and goats. In 1998, it was published a phylogenetic analysis of SRLV and it was proved the cross-species transmission of CAEV and MVV strains; moreover, in 2010, phylogenetic reconstructions supported the existence of SRLV cross-species transmission between domestic and wild small ruminants. SRLVs is a genetic continuum of lentiviral species (MVV, CAEV) in sheep and goats with evidence based of cross species transmission. The high genetic variability of SRLV, generate the classification of the viral genotypes in to five groups and several subtypes, based on the phylogenetic analysis of two long genomic segments: the gag-pol segment (1.8 kb) and the pol segment (1.2 kb). Pathogenesis of lentiviral infections is the result of several particular factors, as the virus strain, the genetics of the host and the microenvironment. All this are influencing the tropism of lentivirus to a particular host animal or cell, tissue or organ. Till present, despite the huge and increasing speed in biotechnics, the pathogenesis of SRLV infections, either in goat or in sheep, is not completely understood and the interaction of the host with those viruses is not fully known.

Key words: SRLV infections, Maedi-Visna, Caprine Arthritis-Encephalitis, MVV, CAEV.

HISTORY

The ovine progressive pneumonia was first reported in Nederland, in 1862, when D.C. Loman described in a Texel rams imported from Spain a sickness with laboured breathing he called zwoegerziekte (Loman, 1862).

At the beginning of the XXth century, W. Robertson (1904) described in South Africa, a chronic catarrhal pneumonia called Jagziekte, followed by D.T. Mitchell in 1915 and E.V. Cowdry in 1925 with detailed epidemiological, etiological, clinical and lesional studies (Robertson, 1904; Mitchell, 1915; Cowdry, 1925).

The first data on the ovine progressive interstitial pneumonia or Montana disease in USA were published in 1923 by H. Marsh, but his official reports were recorded as early as 1915 (Marsh, 1923). Two years later E.V. Cowdry published his studies concerning the origin of the epithelial proliferations in Jagziekte of South Africa (Cowdry, 1925).

Comparing the description of the Montana disease with the Jagziekte description they concluded that they were probably identical (Cowdry and Marsh, 1927).

Later G. De Kock (1929) take into consideration the neoplastic nature of the lesions of Jagziekte in sheep (De Kock, 1929).

Despite of informations accumulated in first three decades of XX th century, in 1930's Iceland registered a devastating disease of sheeps, with 20% to 30% loses in animals older than 2 years of age; the disease characterised by a chronic progressive pulmonary pathology, named Maedi, presented high similarity with the diseases was described by E.V. Cowdry and E.V. Marsh (Marsh, 1923; Cowdry, 1925; Cowdry and Marsh, 1927; Sigurdsson, 1952).

Introduction of Maedi in Iceland was suspected to occur following the import of Karakul rams from Germany in 1933: the first clinical signs appeared six years later, when the disease has been already spread in several Iceland sheep herds (Georgsson, 1990).

A similar disease, called la bouhite, was reported in France in 1942 (Lucan, 1942). In Iceland too, a new demyelinating...