DIDACTICS TO ACQUIRE COMPETENCES IN DISEASE DIAGNOSIS IN THE VETERINARY MEDICINE CAREER
DIDÁCTICA PARA ADQUIRIR COMPETENCIAS EN EL DIAGNÓSTICO DE LAS ENFERMEDADES EN LA CARRERA DE MEDICINA VETERINARIA

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Abstract

The objective of this paper is to introduce "the pathmorphological or lesional approach" as a didactic tool to acquire competences in disease diagnosis. For this purpose the contents of the veterinary medicine syllabus and the concept and definition of competence related to "human resources building" were revised. It was observed that the subjects related to diagnostic competences integrate three well defined fields: clinical, pathological and preventive and the diagnostic competences of veterinary graduates were established according to the document *"Plan de Estudios Básico de Formación Veterinaria Directrices de la OIE, 2013"* . It was established the basis to efficiently apply the "pathmorphological or lesional approach" for disease diagnosis as a new conception to develop the teaching-learning process, using the disease affected organ or organic system as an invariant. We concluded that utilizing the "pathmorphological or lesional approach" as a didactic tool to develop the disease teaching-learning process, facilitates the appropriation of knowledge, the development of the logical thinking and the acquisition of diagnostic competences in veterinary medicine.

Key words: competences, didactics, diagnosis, invariants, organs

Resumen

El objetivo de este trabajo es introducir el "enfoque patomorfológico o lesional" como herramienta didáctica para adquirir competencias en el diagnóstico de las enfermedades. Para este propósito se revisaron los contenidos de los planes de estudio de la carrera de Medicina Veterinaria y el concepto y definición de competencia en el ámbito de la formación de recursos humanos. Se observó que las competencias diagnósticas del médico veterinario se relacionan con las asignaturas que integran tres campos bien definidos: clínico, patológico y preventivo; se establecieron las competencias diagnósticas del médico veterinario en correspondencia con las emitidas en el documento "Plan de Estudios Básico de Formación Veterinaria Directrices de la OIE, 2013". Se relacionan las bases para aplicar con eficiencia el enfoque patomorfológico o lesional para el diagnóstico de las enfermedades, como una nueva concepción para desarrollar el proceso enseñanza-aprendizaje, utilizando como invariante el órgano o sistema de órganos afectado de enfermedad de la economía animal. Se concluyó que: "Utilizar el enfoque pato-morfológico o lesional como herramienta didáctica para el desarrollo del proceso enseñanza-aprendizaje de las enfermedades, facilita para el estudiante: la apropiación del conocimiento, el desarrollo del pensamiento lógico abstracto y la adquisición de competencias diagnósticas en medicina veterinaria".

Palabras clave: competencias, didáctica, diagnóstico, invariantes, órganos

Introduction

In the curricula of the Veterinary Medicine Career, diagnostic competencies are related to subjects that make up three well-defined fields: clinical (semiology and propaedeutics, internal medicine), pathology (pathological anatomy, pathological diagnosis), and preventive (zoohygiene). and veterinary epidemiology, infectious diseases, and the subjects included in the discipline animal health and management) (Roque et al, 2019).

These subjects, which cover around 50% of the hours in the study curriculum, are considered "hard" (Becher, 1994; Chamizo, 2011), appropriating the knowledge and acquiring the skills related to the diagnosis of diseases in the various species that are studied. addressed during the degree, it is not an easy task for students, it is necessary to introduce didactic tools to facilitate the teaching-learning process of diseases and their diagnosis. (Tigelaar, et al, 2004). In relation to the education and training of human resources, "competencies" refers to a complex system of knowledge, beliefs and actions built from the well-organized mastery of different knowledge (Simone, 2002). It includes the domains of knowledge, the skill in the required techniques and also the ability to function (Calderón, 2012). Competencies designate: knowledge: cognitive abilities, that is, mental abilities; skills: ability to carry out specific tasks; attitudes: affective capacity, referring to feelings and emotions, and aptitudes: natural ability, talent or learning capacity of the student (OIE, 2012). In this way, it seeks to encompass comprehensive training by directing educational actions towards knowing, being and doing. The DeSeCo (Definition and Selection of Competencies) project, sponsored by the OECD, sought to identify key competencies in the new global context, defining competence as "the ability to respond to individual or social demands to carry out an activity or task" from a combination of "interrelated practical and cognitive skills, knowledge (including tacit knowledge), motivation, values, attitudes, emotions and other social and behavioral elements that can be mobilized together to act effectively" And later we can read that the Competence "is manifested in actions, behaviors or choices that can be observed or measured", which implies that the aim is to establish indicators for its evaluation and measurement. In another important reference, the Tuning Project, indicates that competencies "represent a dynamic combination of knowledge, skills, abilities and values" (González et Wagenaar, 2006). Perrenoud (2008) stated that competence is a comprehensive performance that allows one to identify, interpret, argue, and solve contextual problems with suitability and ethics, integrating knowing how to be, knowing how to do, knowing how to know throughout one's life" (López Gómez , 2016). Competent person is defined as one who possesses the attributes (knowledge, values, skills and attitudes) necessary for the performance of adequate work in accordance with the appropriate standard (Dècret Missions: 1997).

The objective of this article is to introduce the "pathomorphological or lesional approach" as a teaching tool to acquire skills in the diagnosis of diseases.

Development

The World Organization for Animal Health (OIE) in the document "OIE Recommendations on the minimum competencies expected of newly licensed veterinarians to guarantee quality National Veterinary Services" establishes that newly licensed veterinarians must master the basic competencies and have received an introduction to advanced skills. Basic competencies can be divided into "general" and "specific". This document identifies eleven specific and eight advanced competencies (OIE, 2012).

Diagnostic competencies of the veterinarian

The diagnostic competencies of the veterinarian can be specified in:

1. Diagnoses signs and symptoms
2. Takes clinical history and anamnesis
3. Determines animal health before and post mortem
4. Diagnoses macroscopic lesions
5. 5 Develops necropsy protocol
6. Establishes clinical-injury correlation
7. Issues presumptive diagnosis
8. Takes and sends samples to the corresponding laboratories
9. Performs epidemiological analysis in disease outbreaks
10. Identifies animals suspected of pathologies during ante-mortem and post-mortem inspection
11. Detects mandatory reporting diseases (zoonotic and exotic)
12. Contributes to obtaining, transforming and preserving products and foods suitable for human consumption. These competencies generally correspond to those issued in the document "Basic Curriculum for Veterinary Training OIE Guidelines" 2013.

The diagnosis of diseases in the teaching-learning process

In the textbooks that deal with diseases and their diagnosis, whether those that include several species or those that are interested in a single species, they order the diseases from of the etiology or cause of the pathological process (viral, bacterial, parasitic, metabolic diseases). This same arrangement appears in the subject programs and is used in the delivery of lectures and other teaching activities. There are diseases that affect several species and others that are specific to a single species, which results in many diseases to be managed; to appropriate knowledge and acquire diagnostic skills, which, from an academic point of view, is a memory exercise. However, in the professional environment, what is required of the veterinary doctor is the diagnostic orientation of the disease, which works from clinical analysis, observation of the organic lesions present (clinical-pathomorphological or lesion correlation) and taking of samples to send them to the corresponding laboratories and associate them with a pathogenic entity, in the animal or animals in question.

TABLE 1. Example of disease diagnosis summary table.

DISEASE	CLINICAL PICTURE	INJURIES	DIAGNOSTIC PROCEDURE
CLASSICAL SWINE FEVER (CSF), (Swine cholera) Etiology: Togavirus AFRICAN SWINE FEVER (ASF) Etiology: Iridovirus ERYSIPELAS Etiology: Erysipelothrix Rhusiopathiae SALMONELOSIS Etiology: Salmonella cholerae suis; S. typhimurium SEPTICEMIA DUE TO STREPTOCOCCUS Etiology: Steptococcus sp. INTOXICATION BY COUMARIN DERIVATIVES	There is a high fever. In white-skinned animals, the reddish color (skin erythema) or purplish color in the abdominal areas and at the ends of the bars is notable. Petechial and ecchymotic hemorrhages in serous and mucous membranes. In Erysipelas the spots are polygonal in shape and somewhat elevated above the level of the skin. In poisoning by coumarin derivatives, fever does not occur.	In PPC, hemorrhagic infarcts of the spleen are Pathognomonic. In Salmonellosis, the presence of whitish miliary foci in the liver is characteristic. In ASF, hemorrhagic symptoms predominate (in areas free of the disease). In Erysipelas, when the disease evolves for a few days, acute polyarthritis and later verrucous or vegetative endocarditis (pathognomonic lesion) occur. In CPP there is lymphocytic encephalitis. Suppurative meningitis may occur in streptococcal sepsis and salmonellosis.	ASF is an exotic notifiable disease. In case of suspicion of CSF, in unvaccinated animals the presence of hemorrhagic infarcts in the spleen is highly suggestive of the disease. Complete tonsils and fragments of lymph nodes, spleen, lung and kidney are taken and placed in a clean container to be preserved cold or frozen for virology. Brain samples in 10% formalin can be sent for histopathology. If erysipelas, salmonellosis, or streptococcosis is suspected, lung, liver, spleen, and kidney samples are sent in sterile containers for bacteriology. They should be preserved cold (they should not be frozen). Blood can be taken from the heart with a sterile syringe in fresh cadavers.

TABLE 2. Groups of diseases according to the organ or organ system affected, (Chamizo, 2021)

NAME OF THE DISEASE GROUPS ACCORDING TO THE ORGAN OR ORGAN SYSTEM AFFECTED, according to Chamizo, 2021
From the peripheral vascular system (Septicemic and hemorrhagic)
From the oral cavity (vesicular, erosive and ulcerative stomatitis)
From the digestive tract (Enteritis and diarrhea)
From the respiratory tract and lungs (Rhinitis and pneumonia)
Diseases with pathomorphological manifestations of hemolytic anemia
From the central nervous system (Encephalitis, encephalomalacia)
Of the skin (Dermatitis and dermatoses)
Del tracto reproductivo de la hembra (enfermedades que provocan infertilidad y aborto)
From the male reproductive tract (Orchitis, epididymitis)
Of the heart and pericardium (degenerative, necrotic and inflammatory heart disease)
Of skeletal muscles (degenerative, necrotic and inflammatory myopathies)

What does the pathomorphological or lesion approach consist of for the diagnosis of diseases?

A new conception results to develop the teaching-learning process of diseases and their diagnosis, in which the organ or system of organs affected by disease (injured) of the animal economy is used as an invariant.

The pathomorphological or lesion approach as a didactic tool for the study of diseases and their diagnosis in animal species was proposed for the first time in published textbooks (Chamizo 1995, 1997, 2004, 2006 and 2009) in which introduced the "Disease Diagnostic Summary Tables" (TABLE 1) in which for the development of the teaching-learning process, diseases were grouped according to the lesions they cause in an organ or organ system regardless of the cause or etiology, this It was considered a technological innovation never before present in texts on the subject and was part of the awards received (Chamizo, 2007; Chamizo, 2009).

These groups (TABLE 2) may be formed arbitrarily (since there are diseases that cause lesions in several organs, so they could be included in more than one group), but the formation of these (groups) means that instead of studying separately several diseases with the same etiology, but with lesions in different organs and organ systems, a type of lesion is recognized in an organ or organ system that occurs or is common in several diseases of different etiology, but that for Their epidemiological significance must be differentiated, regardless of whether the diagnostic procedure is the same or different (for example, the so-called red diseases of pigs, where viruses, bacteria and management problems are included as causes).

The student, based on the examples given in the text, must individually prepare the diagnostic summary tables of diseases; you do not have to memorize the names of each disease, just associate the lesion present in the organs and organ system and know the diagnostic procedure for the group, which is important in working as a professional to obtain the final diagnosis (laboratory) with efficiency. The teaching process is closer to the reality of veterinary work, becomes more logical and facilitates learning the subject.

To efficiently apply the pathomorphological or lesional approach, in addition to grouping the diseases, each animal species must be considered individually. If we are faced with a calf with generalized petechial hemorrhages, we cannot think of swine cholera, since it is recognized that this is a disease exclusive to pigs.

In the development of the teaching-learning process, emphasis should be placed on the diagnosis of those group diseases that produce massive outbreaks or compromise human health; which allows the role of the veterinarian to be based on the "ONE HEALTH" strategy (www.onehealthcommission.org) and with this the importance of acquiring diagnostic skills in veterinary medicine is justified.

Conclusions

Use the patho-morphological or lesional approach as a didactic tool for the development of the teaching-learning process of diseases: it facilitates the appropriation of knowledge, the development of abstract logical thinking and the acquisition of diagnostic skills in veterinary medicine.

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