



# THE IMPORTANCE OF OBJECTIVE CLINICAL EXAMINATION IN PATIENTS WITH TRICHINELLOSIS, REGISTERED IN BRAȘOV COUNTY, BETWEEN 1983 AND 2013

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**Abstract:** In human trichinellosis, it is important to know the peculiarities of objective manifestations in order to associate the antiparasitic therapy to support the systems and organs affected by this disease. We considered 1112 cases of human trichinellosis recorded between 1983 and 2013 in Brașov County. Objective clinical examinations show that cardiovascular manifestations were most frequent (12.32%). Patients showed these characteristics in the following order: angina, palpitations, and shortness of breath. Digestive disorders were found in 11.27% of the patients. Nine percent of the patients presented respiratory clinical signs. Correlating the objective physical findings with the recorded forms of disease we observe that cardiovascular manifestations prevail in all moderate, moderately severe, severe even in the mild form of the disease. These are followed by digestive and respiratory manifestations that are recorded at high parameters in moderate, moderately severe and severe forms of the disease.

## INTRODUCTION

Trichinellosis is a worldwide zoonosis caused by the nematode *Trichinella* spp. The most commonly implicated species in human trichinellosis has been *Trichinella spiralis*. Trichinellosis is a disease that not only is a public health hazard by affecting human patients but also represents an economic problem in porcine animal production and food safety by affecting animals.(1,2)

The human disease is acquired through the consumption of raw or undercooked meat or meat products (e.g., sausage and salami) that harbor *Trichinella* larvae. Although pork is the most common source of infection, meat from a variety of other animals has been implicated, including omnivores (e.g., wild boars), herbivores (e.g., horses, sheep) and carnivores (e.g., bears, cougars, foxes, walrus and dogs).(3,4,5)

Human trichinellosis is characterized by diverse subjective and objective clinical signs that hamper early diagnosis and timely initiation of antiparasitic therapy.(5) It is important to know the features of objective manifestations (6,7) in order to associate the antiparasitic therapy with the medication to support the systems and organs affected by this disease.(8,9,10)

## AIM

Considering that in humans, *Trichinella spiralis* determines a systemic disease, we set out to identify the share of objective symptoms according to the form of the disease.

## MATERIALS AND METHODS

This is a descriptive, retrospective, longitudinal and epidemiologic study that focused on 1112 cases of human trichinellosis, recorded during 1983-2013 in Brașov County,

Romania.

The unit of analysis contains patients diagnosed with trichinellosis when discharged from the Infectious Disease Hospital in Brașov.

The data for this study was derived from the medical records of the hospitalized patients, from the epidemiological investigations provided by the Public Health Authority of Brașov, and the analysis bulletins of the pork, provided by Sanitary Veterinary Direction of Brașov County.

During the objective examination carried out at admission and completed during hospitalization there have been changes in the following systems: cardiovascular, digestive, respiratory, skin, urinary, reproductive, musculoskeletal, nervous, and endocrine. These changes completed or complicated the classic symptoms of trichinellosis, leading to diagnostic errors and delays in establishing an etiological treatment.

## RESULTS AND DISCUSSIONS

From a clinical point of view, trichinellosis in humans is characterized by a polymorphism of subjective and objective symptoms, which depend on the amount of larvae ingested by the patient, but also on the resistance and reactivity of the infected organism, making this disease difficult to diagnose.(4,5)

The importance of symptoms and signs implies a close cooperation between the physician and the patient during the medical consultation, in which the symptoms told by the patient, during the anamnesis, are as important as the signs that the physician objectifies, making a unitary whole for a correct clinical diagnosis.

What is particular about trichinellosis is that this disease, having no specific symptoms or signs of infection, lays

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important problems of differential diagnosis.

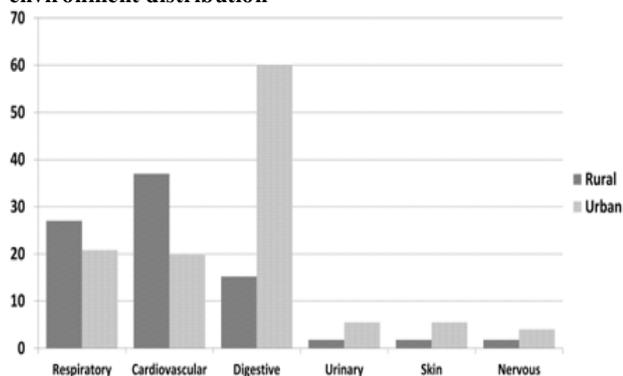
Also, this parasitosis in humans does not have characteristic subjective and objective symptoms; it borrows the symptomatology of the organ or tissue it parasitizes. This complicates the diagnosis and leads to diagnostic errors and underreported cases.(1,4,5)

Given the fact that in our country the diagnosis of trichinellosis in humans is based mainly on clinical criteria and non-specific laboratory criteria, we emphasize the importance of objective clinical examination for the correct recognition of the disease in humans.

Analysing the data obtained from the objective examinations performed on the patients included in our study, we will detail the changes that were highlighted in the following.

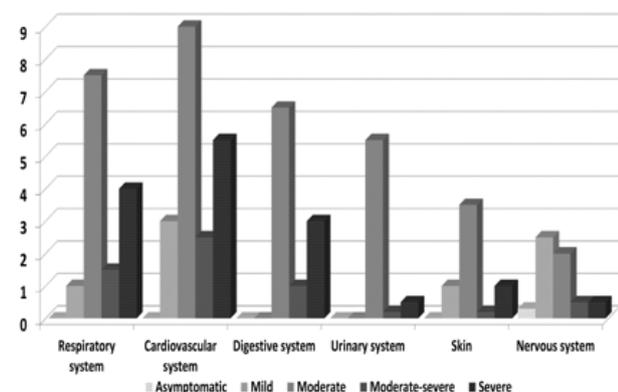
In urban patients, digestive, urinary, skin and nervous manifestations predominated. Cardiovascular and respiratory manifestations are more common to patients from rural areas (figure no. 1).

**Figure no. 1. Objective examination on body systems – living environment distribution**



Compared to children, adults less frequently had digestive manifestations. In adults suffering from trichinellosis, notable clinical changes occurred in the respiratory, cardiovascular, urinary and dermatological systems (figure no. 2).

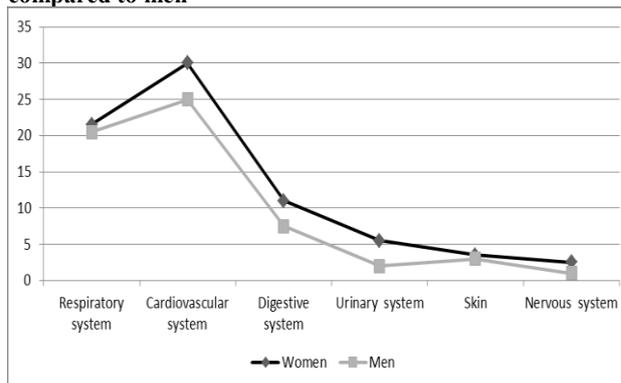
**Figure no. 2. Objective examination on body systems correlated with disease form**



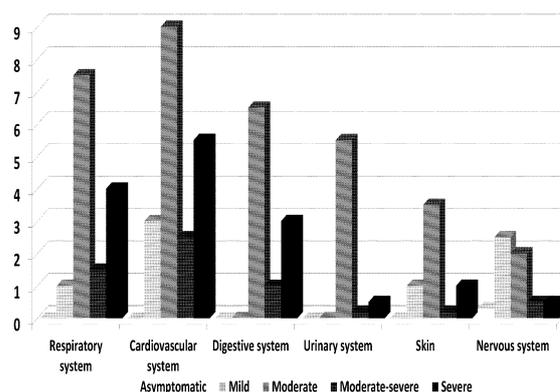
Women had more respiratory, cardiovascular, digestive, urinary and nervous manifestations; men showed a generally similar spectrum of clinical manifestations (figure no. 3).

In the medium and severe forms of disease, we recorded clinical manifestations at high parameters for the following systems: cardiovascular, digestive, respiratory, nervous, renal, skin (figure no. 4).

**Figure no. 3. Objective clinical examination in women compared to men**



**Figure no. 4. Objective clinical examination on body systems correlated with disease form**



In a first phase of the disease, Trichinella larvae create catarrhal enteritis with hyperaemic changes, mucosal oedema, sometimes even small ulcers and even a peritoneal reaction that can be associated with massive infections. These lesions explain the various digestive manifestations with which the disease frequently begins.(9,11,12) In our study digestive disorders (11.27%) reported in patients were: nausea, vomiting, watery diarrhea with abdominal cramps (n=41), epigastric pain accompanied by heartburn, belching (n=17), right upper quadrant pain (spontaneously and on palpation), with nausea, bilious vomiting, and/or loose stools (n=26).

There were 10 patients with gastric or duodenal ulcer, 9 with chronic viral hepatitis, and a patient with gastric cancer surgery. For these patients with pre-existing illness, trichinellosis required updating the diseases they were suffering from. The evolving clinical form of trichinellosis was moderately-severe or severe with pathogenic and etiological treatment more difficult to handle by the patient.

With the migration of larvae throughout the body, there are clinical, pathological, extensive and pronounced systemic manifestations. These types of lesions occur especially in cases of massive infections and with a more serious evolution.(9,12)

Cardiovascular manifestations were the most frequently reported. They appeared in 12.32% of the studied patients, most frequently in moderate, moderately severe and severe forms of the disease. Patients complained of chest pain (n=39), palpitations, and dyspnea (n=11). In these patients reported rhythm disorders (tachycardia -49 cases, extrasystoles - 3 cases, atrial fibrillation- 1 case and bradycardia - 1 case).

Low blood pressure values were recorded in 21 patients and in nine of them were recorded values above the

normal range during hospitalization. High or low blood pressures were not reported until the onset of trichinellosis. The occurrence of a mitral systolic murmur was recorded in 18 patients that had no history of cardiac distress. In patients with myocardial damage (n=13) the investigations were limited to ECG. Peripheral thrombophlebitis were diagnosed and treated in two patients diagnosed with trichinellosis.

Respiratory manifestations were recorded in 9.06% of patients, from which we mention dry or wet cough (n=48 patients) accompanied by dyspnea, with varying degrees of choking sensation caused by the swelling of the larynx (n=36). Bronchial crackles and crepitations accompanied congestive bronchopulmonary (n=19) or pulmonary centers of infection (10 cases of pneumonia and 2 cases of pleuresia).

Obvious skin manifestations appeared in 2.42% of cases (n=31 patients). These were localized on the face or limbs, and others were generalized. Skin manifestations were not dramatic, and were controlled by the antihistamine medication.

Changes in the urinary system (1,68%) were: 8 cases of leucocyturia, 7 glomerulonephritis (which delayed the diagnosis of trichinellosis) and 5 cases of hyaline cylinders proteinuria.

A patient with a solitary kidney made a severe form of the disease, the pre-existing condition contributing to the disease severity.

Intense headache, inconsistently accompanied by dizziness and intense asthenia were observed in all patients with moderate, moderately-severe and severe forms of trichinellosis. Patients with mild disease reported low-intensity or temporary headache.

One percent of patients showed the following manifestations: nystagmus (n=4), anxious depressive symptoms (n=4), restlessness and irritability (n=2), meningism (n=1), dysarthria (n=1), polyradiculoneuritis (n=1).

Disorders of the musculoskeletal system included muscle pain, generalized or localized to specific muscle groups, with or without disability. Existing myalgia in 90% of the studied patients occurred during the period of onset and increased in intensity during the disease state. Myalgia was described as varying in intensity, dull or constrictive in nature, and exacerbated by even minimal physical effort during the course of disease. Myalgia persisted overnight in 60% of patients, preventing sleep, creating a state of anxiety and irritability, and requiring sedatives.

Diabetes mellitus as a pre-existing condition occurred in 6 adult patients, five of whom inhabited urban areas. The form of the disease was moderate in 4 cases and severe in 2. It should be noted that although all such patients suffering from diabetes were being treated for this condition, blood glucose rose to the upper limit of normal, and glycosuria was absent.

Hypothyroidism was observed in three adults: one from an urban and two from rural areas, but did not obviously influence the progression of the moderate form of the disease.

Nine pregnant women were monitored during different periods of pregnancy. All developed moderate forms of the disease. Their children were born normal and did not show any distress at birth. The women were fully recovered within a year without any major complication.

### CONCLUSIONS

Correlating the objective physical findings with the recorded symptoms, we observe that cardiovascular manifestations prevailed in all moderate, moderately-severe, severe and even in the mild form of the disease. These were followed by digestive and respiratory manifestations that frequently occurred in moderate, moderately-severe and severe forms of the disease.

In the future, we intend to identify to what extent such symptoms endure, how the intensity of clinical manifestations changes, and how biological parameters evolve, so as to explore the notion of chronic trichinellosis.

### Conflict of interest statement

No financial or personal relationships are maintained with other people or organizations that could inappropriately influence or bias this paper.

### REFERENCES

1. Gottstein B, Pozio E, Nöckler K. Epidemiology, Diagnosis, Treatment, and Control of Trichinellosis. *Clin Microbiol Rev.* 2009;22(1):127-145.
2. Pozio E. New patterns of Trichinella infections. *Vet. Parasitol.* 2001;98:133-148.
3. Murrell KD, Pozio E. Trichinellosis: the zoonosis that won't go quietly. *Int. J. Parasitol.* 2000;30:1339-1349.
4. Pozio E, Angeles Gomez M, Dupouy-Camet J. Clinical aspects, diagnosis and treatment of trichinellosis. *Expert Review of Anti-infective Therapy.* 2003;1(3):471-482.
5. Dupouy-Camet J, Kociecka W, Bruschi F, Bolas-Fernandez F, Pozio E. Opinion on the diagnosis and treatment of human trichinellosis. *Expert Opin Pharmacother.* 2002;3(8):1117-30.
6. Ozdemir D, Ozkan H, Akkoc N, Onen F, Gurler O, Sari I, Akar S, Birlık M, Kargı A, Ozer E, Pozio E. Acute trichinellosis in children compared with adults. *Pediatr Infect Dis J.* 2005;24(10):897-900.
7. Wang ZQ, Cui J. Diagnosis and treatment of trichinellosis. *Chinese journal of parasitology & parasitic diseases.* 2008;26(1):53-57.
8. Rostami A, Gamble HR, Dupouy-Camet J, Khazan H, Bruschi F. Meat sources of infection for outbreaks of human trichinellosis. *Food Microbiol.* 2017;64:65-71.
9. Bruschi F. Helminth Infections and their Impact on Global Public Health. Springer; 2014;229-273.
10. Gajadhar AA, Pozio E, Gamble HR, Nöckler K, Maddox-Hyttel C, Forbes LB, Vallée I, Rossi P, Marinculić A, Boireau P. Trichinella diagnostics and control: mandatory and best practices for ensuring food safety. *Vet Parasitol.* 2009;159(3-4):197-205.
11. Kociecka W. Trichinellosis: human disease, diagnosis and treatment. *Vet Parasitol.* 2000;93(3-4):365-83.
12. Capó V, Despommier DD. Clinical aspects of infection with Trichinella spp. *Clin Microbiol Rev.* 1996;9(1):47-54.