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Results of the follow-up of the former trichinosis patients from Brasov County – Romania

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ABSTRACT

The objective of the study was to monitor for a period of 2 years (at 1, 3, 6, 9, 12, and 24 months) a group of former trichinellosis patients ($n = 699$) registered in Braşov county before the initiation of the National Supervision and Control Programme for trichinellosis in humans. During the study, immediate complications up to 6 months from hospital release, and related complications occurring up to 24 months from hospital release were identified. Immediate complications were cardiovascular (31%), muscular (19%), neurological (18%), ophthalmic (17%), allergic (9%), respiratory (1%), and other (5%). Complications were more frequent in children from the studied group, even if the trichinellosis disease manifestation was mild or moderate. Complications were also more frequent in female as compared to male patients, and in urban areas as compared to rural environments. Paraclinical data showed eosinophilia in 8–22% of patients, GPT and GOT within normal limits, and hypoproteinemia in the case of 178 former patients (31%). Hypocalcaemia and hypomagnesaemia persisted in the case of 401 former patients (71%). Two months following illness, 53 (9.4%) of the former patients remained ill, and 26 of them had retired on medical grounds. Nine months following illness, 212 (37.8%) of the former patients reported fatigue, myalgia (especially in the inferior limbs), cardiovascular disorders, neurological, psychiatric, and allergic illnesses. After one year, 102 (18%) of the former patients reported improvements in asthenia, muscular pains, allergic reactions, hypertension, cardiac arrhythmia, and angina pectoris crises. Trichinosis in humans cannot be considered only an acute disease that, once properly treated, etiologically, pathogenically, and symptomatically improves, but it can also become a chronic illness.

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1. Introduction

On both the national and international levels, there is increasing discussion of human trichinosis as a disease which cannot solely be cured through the etiological, pathogenic, and symptomatic treatment of the acute phase, but may pose problems as a chronic illness to infected patients even after completion of treatment. Chronic symptomology resulting from localization of

parasite cysts in the striated muscular masses could potentially prevent complete recovery of health (Chiotan and Airinei, 1994b; Gherman, 1986).

2. Materials and methods

The study analyzed results of hospitalization and follow-up during a 2 year period of 699 patients diagnosed with trichinosis in the county of Braşov – Romania, before the introduction of the National Supervision and Control Programme for trichinellosis in humans.

The study was completed under the auspices of the Department of Parasitology of the Inspectorate of Public Health, Braşov, with the support of specialized services in

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the county polyclinics and of the clinical laboratories within hospitals and private laboratories.

Physical and clinical examination of patients took place at periodic intervals of 1, 3, 6, 12, 24 months after their release from the hospital, and changes in their health situation were recorded. Subjective data was provided by the patients; objective clinical data was derived from specialized physical examinations and laboratory analyses of patient tissues.

Types of complications experienced by patients during hospitalization and follow-up were categorized as immediate complications, occurring up to 6 months since beginning convalescence, or chronic complications, occurring up to 24 months since beginning convalescence.

3. Results and discussions

The Sheet of Observation from each trichinellosis patient included observations from the treating physician on the patient's condition upon leaving the hospital (Ambrosioni et al., 2006; Calcagno et al., 2005; Chotmongkol et al., 2005). Of the total number of patients hospitalized during the study, only 38 (14%) were considered "cured" at hospital discharge. The remaining 226 (86%) were released with the notation "improved" (Fig. 1). There were of four patients who died as a result of cardiovascular complications in the 6 months following infection.

Moreover, when observations on all patients were included, those either hospitalized or treated at home, the percentage of patients recorded as completely cured was much lower than the percentage of patients recorded as improved. Of the 699 patients, only 132 (19%) were considered cured, and 561(80%) were labelled as improved. Of the patients that had been treated at home, two died within 6 months of becoming ill with trichinosis because of cardiovascular or neurological complications. These ailments were not noted in patients before they became ill with trichinosis. The total number of deaths in the first 6 months after becoming ill with trichinosis in all

patients was 6 (1%), indicating the gravity of the illness. The immediate complications of trichinosis in this group of patients included cardiovascular (31%), muscular (19%), neurological (18%), ophthalmological (17%), allergic (9%), respiratory (1%), other (5%).

The most frequent cardiovascular complications were disorders of cardiac rhythm (tachycardia, extrasystoles) related to atrioventricular blocks, minor or major; crises of pectoral angina; acute myocardial infarct supported by modifications during the EKG and echocardiography; peripheral thrombophlebitis especially in the inferior members; and peripheral acute ischemia. In a chronic ulcerous patient under specific treatment, a superior digestive haemorrhage was recorded (Calcagno et al., 2005; Puljiz et al., 2005).

Muscular pains, frequently seen in patients in the first 6 months after infection, caused various degrees of functional impairment, including difficulty in active movements, requirement for long rest periods, and difficulty in resuming professional or household obligations. From the total number of patients who presented muscular complications, two were highly qualified locksmiths who were compelled to change profession, and one was a bar gymnast who had to resume his former job as a Morocco leather worker.

The neurological disorders presented as polyneuritis, facial paralysis, sciatalgia, Jacksonian crisis, and vascular cerebral accidents (Awada and Kojan, 2003). These cases generally necessitated specialized medical assistance, entailing hospitalizations, prolonged medical leaves, or retirements; neurological complications resulted in more serious impairment in patients. A number of patients reported (especially in the first 6 months) sight disorders with diminution of the visual acuity, with pains in the movement of the ocular globes. Allergic complications manifested themselves as cutaneous-mucous eruptions necessitating anti-allergic treatments.

The diagnosis of trichinosis was not recognized in two patients until after the patients had been seen by several specialized services (internal diseases, cardiology). These two patients had severe forms of trichinosis, and had benefited from transfusions administered due to pronounced anaemia at the Hospital of Infectious Diseases. These patients contracted (within 3–4 months after leaving the hospital) viral hepatitis B with antigen HBs positive, medium form, requiring retirement.

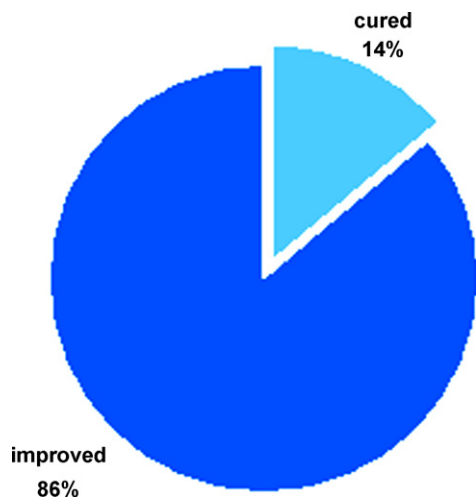


Fig. 1. Percentage of patients reported as 'cured' versus 'improved' at the time of hospital discharge.

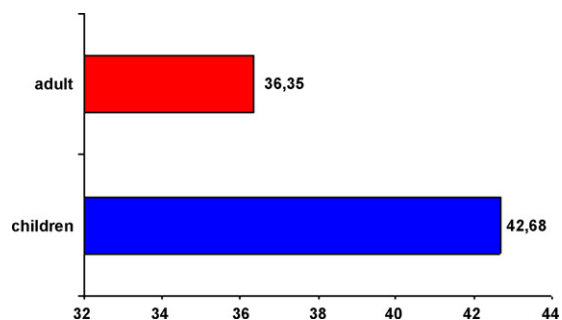


Fig. 2. Immediate complications resulting from *Trichinella* infection reported for adults versus children within 6 months of infection.

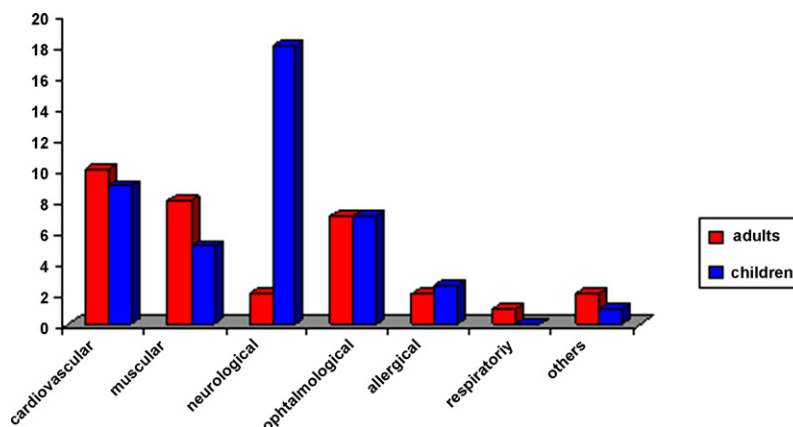


Fig. 3. Percentage of patients (adults versus children) reporting specific complications resulting from *Trichinella* infection.

Immediate complications of trichinosis in adults versus children demonstrated that trichinosis is a more serious disease in children; children suffered complications more frequently than adults, even if the form of disease the children had exhibited had been mild or moderate in severity (Fig. 2). Children surpassed adults in neuro-psychiatric complications. A severe asthenia with a diminution in school performance was recorded in all school children included in the study. Many complained of sight ailments, diminution of visual acuity, nistagmus in four children, and complications of the cardiovascular system (Fig. 3). Adult females were more susceptible to complications, perhaps resulting from higher initial consumption of ML through women's habit of tasting meat preparations that have not yet been thermally processed (Fig. 4).

Comparison of immediate complications revealed their higher prevalence in urban patients versus rural patients

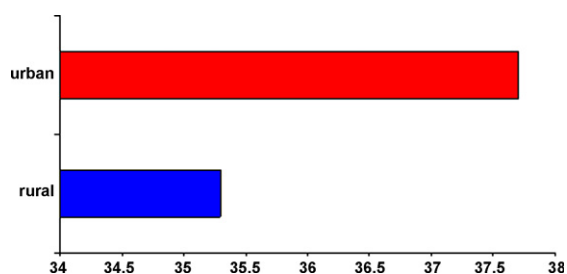


Fig. 5. Complication prevalence in rural versus urban patients.

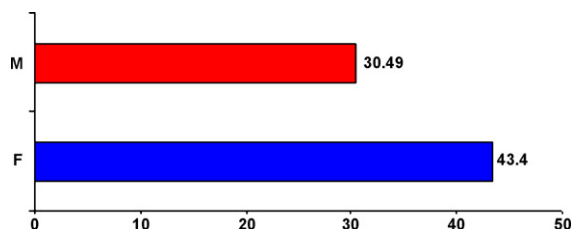


Fig. 4. Percentage of patients (male (m) versus female (f)) that reported complications resulting from *Trichinella* infection.

(Fig. 5), a fact which might be explained by increased resistance of the inhabitants of rural areas to infection with trichinosis due to repeated exposure to *Trichinella* larvae caused by regular consumption of pork meat from their own household. Urban consumers typically prefer consumption of pork meat from commercial sources. However, cardio-vascular and ophthalmological complications were more frequent in the rural patients as compared to urban patients (data not shown) (Ambrosioni et al., 2006; Chiotan and Airinei, 1994b).

In patients who were reported as improved rather than cured, clinical laboratory analysis demonstrated that the number of leukocytes was in the normal range, and eosinophilia between 8–22% was seen in all patients. TGP and TGO values were normal, however hypoproteinaemia amounted to sub-unitary values in 178 (31%) of the patients. Low calcium and magnesium values were encountered in 401 (71%) of patients, which may have contributed to the pronounced asthenia, muscular pains, retro-obituary pains, and psychological depression that was observed (Ambrosioni et al., 2006; Calcagno et al., 2005; Pielok, 2001).

Nine months after becoming infected, 212 of 561 (37.8%) of patients reported as improved complained of fatigue, pains in the muscular masses (especially in the inferior members), cardiovascular, neurological, psychiatric, and allergologic disorders (Chiotan and Airinei, 1994a; Kozar et al., 1964; Piergili-Fioretti et al., 2005). Twelve months after the onset of illness, 102 (18%) of patients reported as improved complained of asthenia, muscular pains, allergic manifestations, hypertension, disorders of cardiac rhythm, and crises of pectoral angina. Related complaints of requirements for specialized services from the polyclinics and hospitals, prolonged medical leaves, and costly medical treatments were also reported. Twenty-four months after the onset of illness, 53 (9.4%) of patients remained ill; 26 patients were forced to retire from their jobs because of illness. The number of deceased persons increased to 12, resulting from cardiovascular and neurological complications, which would not have been expected as a result of known pre-existing conditions. All deaths had occurred within the first 18 months after infection.

4. Conclusion

Trichinosis in humans cannot be considered an acute ailment which, treated in an adequate manner, etiologically, pathogenically and symptomatically, will improve. It may become chronic, causing long term illness in the patient. Chronic trichinosis requires differentiated and prolonged treatments addressed to various types of medical specialization, according to the nature of the complications; however, the treatment may not significantly impact the health of the patient. Chronic trichinosis sickens patients to different degrees, occasionally requiring job reorientation or retirement. In the worst cases, death may also result. Human trichinosis must be treated with seriousness in this context, both as regards the precocity of the clinical, epidemiological and laboratory diagnosis, and as regards an etiological, pathogenic and symptomatic treatment that should diminish the chance of this disease becoming chronic with negative repercussions upon the patient, both from a physical and social standpoint.

Conflict of interest statement

None of the authors (Codruța Nemet, Liliana Rogozea, Răzvan Dejica) has a financial or personal relationship with other people or organisations that could inappropriately influence or bias the paper entitled “Results of the Follow-

up of the Former Trichinosis Patients from Brasov County – Romania.”

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