PRESENT STATUS OF TRICHLINELLOSIS IN YUGOSLAVIA: SERBIA
CUPERLOVIC K.*, DJORDJEVIC M.**, PAVLOVIC S.** & SOFRONIC-MILOSAVLJEVIC L.*

Summary:
Trichinellosis was recognized almost one century ago as a health and animal husbandry problem in Serbia. In the last 10 years, trichinellosis has been expanding from three endemic regions (Srem, Macva and Negotinska Krajina) to neighbouring regions. The infection rate detected by veterinary inspection in 1999 year was 0.17% in slaughtered swines. Simultaneously, the number of infected humans increased three-five times in comparison with the period 1980-1990. For instance, 555 individuals were registered in 1999 as infected after the consummation of non-inspected pork from domestic swine or wild boar. Prevalence of trichinellosis in wild animals was examined more than a 20 years ago. The trichinellosis in horses has not been detected in the country, but infected horses imported from Serbia were detected in France and Italy.

KEY WORDS: trichinellosis, prevalence, Serbia.

EPIZOOTIOLOGY AND EPIDEMIOLOGY OF TRICHLINELLOSIS

Trichinellosis is the most serious problem of all the food borne parasitic diseases in Serbia in the last decades. For the first time it was detected in pigs at the beginning of the previous century when large quantities of live swine were exported to Germany, where trichinoscopy of pork was obligatory even then. Meat inspectors in Berlin detected Trichinella spiralis infection in 0.11% carcasses from pigs imported from Serbia (Djordjevic, 1989). The first outbreak of human trichinellosis in Serbia was described at Zemun hospital in 1923. Veterinary inspection of pork for public use is obligatory since 1952. The number of infected pigs before World War II was high, but exact figures are not available. However, the reported number of infected humans was much lower before the World War II, possibly due to the better recognition of the human trichinellosis in last decades.

* Institute for the Application of Nuclear Energy (INEP), Banatska 31b, 11080 Belgrade, Yugoslavia.
** Institute for Meat Technology and Hygiene, Kacanskog 13, 11000 Beograd, Yugoslavia.
Correspondence: K. Cuperlovic.
Tel.: 381 11 671 067 - e-mail: mculf@nbnet.nb.ca

Parasite, 2001, 8, S95-S97
and tragedies, resulted in the spread of parasitic infections. Swine trichinellosis spread from previously restricted three endemic regions to almost the entire country, where previously it was rare and sporadic. The prevalence of trichinellosis increased particularly in the province of Srem at the border of Slavonia (Croatia), previously discovered in the US-Yugoslav studies as an endemic area. Then, for the first time, trichinellosis was detected in one industrial farm, while in some non-industrial farms close to the border the prevalence of trichinellosis reached 50% of the examined swine. Trichinellosis was also found among dogs and rats in these farms (Dimitrijevic et al., 1996).

The prevalence of trichinellosis among slaughtered swine detected by parasitological examinations (trichinoscopy or enzymatic digestion) in the last six years (1994-1999) shows that the spreading of trichinellosis was fast and permanent (Table I). The percentage of infected swine reached and passed numbers found at the beginning of the previous century. The number of examined swine carcasses has increased, particularly for swine slaughtered at farms for domestic consumption (Table I). That is of importance for the prevention of human trichinellosis, established mostly after the consumption of non-inspected or non-regularly inspected pork or meat products like sausages.

The occurrence of trichinellosis in human for the period 1994-1999 ranged between 395 cases (1998) and 804 (1997). In 1994, it amounted to 493, in 1995 to 803, in 1996 to 598 and in 1999 to 555 infected individuals. All serologically positive persons with or without clinical signs of the disease were considered as infected. Horse trichinellosis was not detected in carcasses inspected at two specialized slaughterhouses (Vincza, Novi Sad), between 1994 and 1999, even when sample size for the enzymatic digestion method was increased from five to 10 grams of meat. However, in 1998 two outbreaks took place in France with more than 500 humans infected after consumption of horse meat originating from live horses imported from Yugoslavia, slaughtered in France and meat inspected by their veterinary services.

**DISCUSSION**

Trichinellosis is recognized in Serbia, by professionals and the authorities, as a serious health and animal husbandry problem. Therefore Ministry of Agriculture, Forestry and Water Supply and Ministry of Health of The Republic of Serbia formed in 1990 an advisory board called The Commission for Trichinellosis. The aim of the board is to help veterinary and health services, by the expertise and advice, in the prevention of human infection and eradication of swine trichinellosis. The activities of the Commission could be briefly summarized as follows:

1. To follow epidemiology and epizootiology of trichinellosis in the country and offer professional help to the veterinary and health services.
2. To propose amendments to existing regulations, instructions and directives to authorities, based on country’s needs and legislation in the world, primarily that of OIE and EC. At the moment the existing regulations in Serbia fulfill the request for the prevention of human trichinellosis and for the reduction of swine trichinellosis.
3. To stimulate organization of seminars, lectures, symposia and present scientific and professional news in the field of trichinellosis as well as the changes in legislation.
4. To assist the Ministry of Agriculture in the preparation of the Annual program for health protection of domestic animals.
5. To perform regular control of the laboratories engaged in meat inspection and equalizes the applied diagnostic methods in accordance with existing regulations.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of inspected pigs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At slaughterhouses</td>
<td>1,270,602</td>
<td>1,395,895</td>
<td>1,554,093</td>
<td>1,723,237</td>
<td>1,442,054</td>
<td>1,200,000</td>
</tr>
<tr>
<td>At farms</td>
<td>268,549</td>
<td>152,713</td>
<td>255,377</td>
<td>627,452</td>
<td>543,029</td>
<td>853,782</td>
</tr>
<tr>
<td>Total</td>
<td>1,539,151</td>
<td>1,548,608</td>
<td>1,809,470</td>
<td>2,350,689</td>
<td>1,985,083</td>
<td>2,053,782</td>
</tr>
<tr>
<td><strong>Number of infected pigs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At slaughterhouses</td>
<td>441</td>
<td>837</td>
<td>1,469</td>
<td>1,500</td>
<td>1,156</td>
<td>1,185</td>
</tr>
<tr>
<td>At farms</td>
<td>543</td>
<td>490</td>
<td>736</td>
<td>943</td>
<td>1,487</td>
<td>2,290</td>
</tr>
<tr>
<td>Total</td>
<td>984</td>
<td>1,327</td>
<td>2,205</td>
<td>2,443</td>
<td>2,643</td>
<td>3,475</td>
</tr>
<tr>
<td><strong>Prevalence (% infections)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At slaughterhouses</td>
<td>0.03</td>
<td>0.06</td>
<td>0.09</td>
<td>0.09</td>
<td>0.08</td>
<td>0.10</td>
</tr>
<tr>
<td>At farms</td>
<td>0.20</td>
<td>0.32</td>
<td>0.29</td>
<td>0.15</td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>Total</td>
<td>0.06</td>
<td>0.08</td>
<td>0.12</td>
<td>0.10</td>
<td>0.13</td>
<td>0.17</td>
</tr>
</tbody>
</table>

6. To introduce Quality Assurance System for trichinoscopy, enzymatic digestion method and serology testing of *Trichinella* infection in human, livestock and game animals.

In spite of the efforts of professionals, trichinellosis in Serbia is spreading in humans presumably as direct consequence of disturbing events over the population in the last years (civil war, brake up of former country, NATO attack, EC sanctions, significant decrease of national income, financial difficulties and others), although many other factors are also present (regulations are not always applied, responsible services and authorities are not coordinated in eradication of trichinellosis, illegal meat turnover, etc.). Control and limitation of these factors could result in the additional prevention of human trichinellosis and significant reduction in the infection of swine.

REFERENCES


CUPERLovic K. Trihineloza ljudi i zivotinja, Medicinska knjiga, Beograd (II izdanje), 1995.


