

PREVALENCE OF ACID-FAST BACILLI IN THE MUSCLE TISSUE OF SLAUGHTER PIGS WITH TUBERCULOUS-LIKE LESIONS IN THE LYMPH NODES

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SUMMARY

Altogether 287 slaughter pigs with pathologically changed lymph nodes were examined. From the submandibular and mesenteric lymph nodes of 230 /80% animals, 199 strains of *Myc. avium* and 42 atypical bacilli were isolated. *Myc. tuberculosis* and *Myc. bovis* were not found. Of the 861 samples of muscles 22 /all from 16 animals/ were infected with 23 strains of acid-fast bacilli. Among these strains 15 belonged to *Myc. avium* and 8 were atypical. From 14/16 animals the mycobacteria isolated from muscles had some different serological or biochemical properties than those from the lymph nodes. Taking this into account, no evidence was found that mycobacteria isolated from the lymph nodes resemble those in the muscle of slaughter pigs.

INTRODUCTION

The pigs are the animals which can be easily infected with different acid-fast bacilli. This type of infection is usually characterized by tuberculous-like lesions localized mainly in the submandibular and mesenteric lymph nodes /Bergman and Gotze., 1965, 1967; Kilian., 1982; Kwiatek et al., 1986; Prost., 1968/.

The studies carried out in this country and elsewhere indicated that tuberculous-like changes in the lymph nodes of slaughter pigs were related to the prevalence of acid-fast bacilli in the muscle tissue /Bergman and Götze., 1965, 1967; Kilian., 1982; Pavlas and Patlakowa., 1985; Prost., 1968; Schaal., 1966/. The objective of this study was to clear up the etiology of tuberculous-like lesions in the submandibular and mesenteric lymph nodes of slaughter pigs and to determine if the same causative agent was disseminated in their muscle tissue. The practical aim of the work was to furnish up to date argumentation for post mortem judgment of pork carcasses.

MATERIALS AND METHODS

Two hundred and eighty seven slaughter pigs with tuberculous-like lesions in the submandibular and mesenteric lymph nodes were examined. All carcasses were selected after official meat inspection at a commercial slaughter-house. From each carcass the following materials have been sampled: pathologically changed lymph nodes and the muscles mase-ter, sternomandibularic, biceps brachii and gracilis. Samples weighing 40 g. were homogenized /Stomacher model 400/ with a double quantity of 5% oxalic acid. After suitable treatment /Zórawski and Skwarek., 1980/ homogenate /sediment/ was streaked on the Lowenstein-Jensen, Stonebrink and

Petragnani culture media /2 test tubes for each/ next incubated at 37°C.

The growth was reviewed after 7 days and 2, 4, 8 weeks. The acid-fast bacilli were identified by cultural, biochemical and serological tests. With the cultural tests, the growth at 25°C and 45°C, morphological appearance and photochromogenicity were observed /Kubica., 1975; Zórawski and Skwarek 1980/. The following biochemical tests were carried out: arylsulphatase and catalase activities /Kubica and Vestal., 1961; Kubica., 1975/ nitrate reduction /Virtanen., 1960; Tsukamura., 1967/, niacin production /Kubica., 1975/, amide activity /Bönicke., 1959, 1960/ and hydrolysis of Tween 80 /Wayne., 1964/. The serotyping was performed with different antisera specific for *Myc. avium*-intracellulare group, which were prepared by hyperimmunization of rabbits with strains of bacilli obtained from US-Japan Cooperative Medical Science Program-NIAID /Schaefer., 1965; Wolinsky and Schaefer., 1973/.

RESULTS AND DISCUSSION

The results of bacteriological determination of pathologically changed lymph nodes have been presented in tabl. 1.

Acid-fast bacilli were isolated from 230 animals of 287 being examined. Altogether 241 mycobacterial strains were isolated. Among them 199 *Myc. avium* and 42 atypical bacilli were described. From 861 samples of muscles being bacteriologically examined 22 were positive for acid-fast bacilli. Altogether 23 mycobacterial strains were isolated from which 15 were classified as *Myc. avium* and 8 as atypical bacilli. By serotyping it was proved that *Myc. avium* strains serotype 2 prevailed in the lymph nodes /77%/, as well as in the muscles /60%/. Other serotypes as 1, 3 and double occurred scarcely and were represented by 6.1%, 8.2% and 8.8% respectively. The majority of atypical bacilli belonged to *Myc. fortuitum* /20/ *Myc. intracellulare* /16/ *Myc. terrae* /7/ and *Myc. vaccae* /4/. Moreover, some other bacilli as *Myc. triviale*, *Myc. flavescens* and *Myc. scrofulaceum* were found.

The comparison of cultural, biochemical and serological properties of acid-fast bacilli from tuberculous-like changed lymph nodes with those from the muscles have shown that in 14 cases the strains from muscles were different from those occurring in the lymph nodes. In this case it is probable that acid-fast bacilli found in the muscles had not any relationship with those from the lymph nodes. These findings being in agreement with those of Payeura /1983/ may have practical importance for judgement of pork infected with mycobacteria. The results obtained have revealed a relatively high number of the lymph nodes infected with *Myc. avium*. It is known that small private farms in Poland are main pig producers. At these farms hens have very often free access to the pigs. This route of contamination has been proved by many authors /Engbaek et al., 1968; Meissner and Anz., 1977; Spryszak

and Zięba., 1968/. Fortunately, *Myc. avium* is not dangerous for human being. Of course, it can not be neglected as a pathogen /Afzelius., 1981; Grohman., 1977/. So, preventive measures have to be taken to save food animals, especially pigs in small farms, against this type of infection.

It is not unexpected that we failed in *Myc. tuberculosis* and *Myc. bovis* isolation from the lymph nodes as well as from the muscles. Taking into account the above mentioned mycobacteria, epizootical situation in Poland is satisfactory. *Tbc. bovis* in cattle has been eradicated since 1975.

REFERENCES

Afzelius L.B., Bekassy A., Bende M., Garwicz S., Grubb R. 1981. *Lakartidningen*, 78, 121.
 Bergman G., Götze U. 1965. *Archiv Lebensmittel-hyg.* 16, 193.
 Bergman G., Götze U. 1967. *Archiv Lebensmittel-hyg.* 18, 104.
 Bönicke R., Lisboa B.P. 1959. *Tuberkulosearzt.* 13, 377.
 Bönicke R., Lisboa B.P. 1960. *Zentbl. Bakt. Parasitkde I.* 176, 403.
 Engbaek H.C., Vergmann B., Baess J., Bentzon M.W. 1968. *Acta path. et microbiol. scandinav.* 72, 277.
 Grohman R. 1977. *Zbl. Bakt. Hyg. I. Abt. Orig.* A. 238, 503.
 Kilian H. 1982. *Freien Universitat, Berlin Journal* Nr. 1078.
 Kwiatek K., Żórawski C., Wojtoń B., Skwarek P. 1986. *Medycyna Wet.* 42, 600.
 Kubica G.P. 1975. *Am. Rev. resp. Dis.* 107, 9.
 Kubica G.P., Vestal A.L. 1961. *Am. Rev. resp. Dis.* 116, 1057.
 Meissner G., Anz W. 1977. *Am. Rev. resp. Dis.* 116, 1057.
 Pavlas M., Patlakowa V., Masaras E. 1985. *Acta*

vet. Brno. 54, 217.
 Payeur J.B. 1983. *Diss. Abstr.* 43, 3488.
 Prost E. 1968. *Medycyna Wet.* 24, 738.
 Schaefer W.B. 1965. *Am. Rev. resp. Dis.* 92, 85.
 Spryszak A., Zięba T. 1968. *Medycyna Wet.* 24, 709.
 Tsukamura M. 1967. *Tubercle, Lond.* 48, 311.
 Wayne L.G., Doubek J.R., Russel R.L. 1964. *Am. Rev. resp. Dis.* 90, 588.
 Wolinsky W., Schaefer W.B. 1973. *Int. J. syst. Bact.* 23, 182.
 Virtanen S. 1960. *Acta tuberc. Scand. Suppl.* 48, 1.
 Żórawski C., Skwarek P. 1980. *I. Wet. Puławy.*

Table 1. Number and percentage of *Myc. avium* strains and atypical bacilli isolated from lymph nodes and muscle tissue of pigs.

Material examined	Number and /percentage/			
	Positive samples	<i>Myc. avium</i>	Atypical bacilli	Total No. of strains
Muscle tissue - 861	22 /2.5/	15 /65/	8 /35/	23 /100/
Lymph nodes - 287	230 /80.1/	199 /82.6/	42 /17.4/	241 /100/