

Diagnosis of *Echinococcus* infection in humans based on PCR-RFLP analysis

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Introduction. Identification of *Echinococcus* infecting humans is based on molecular and immunological diagnostic approaches combined with comparative morphology. *Echinococcus granulosus* and *E. multilocularis* are the causative agents of cystic echinococcosis (CE; hydatid disease) and alveolar echinococcosis (AE) respectively, in humans. *E. granulosus* is found in sheep, pigs and cattle and there are also wild carnivore/wild herbivore cycles. The cysts of *E. granulosus* in man are usually single and occur in the liver, lungs, brain, heart and bones. *E. multilocularis* is usually found in foxes. The cysts of *E. multilocularis* resemble a slowly growing malignant growth in the liver and sometimes occur in lymph glands, lungs and brain. Identification of *Echinococcus* larvae isolated from human tissues, based on morphological study, is not an adequate tool for species and strain differentiation. Therefore in order to identify *Echinococcus* genotype, the PCR-RFLP method was applied.

Materials and methods. 10 samples of larva fragments (parts of cysts and/or protoscolices) obtained from human hepatectomy, were examined. DNA was isolated using a DNA extraction NucleoSpin Kit (Macherey-Nagel). The PCR-amplified region was the mitochondrial NADH dehydrogenase 1 (ND1) gene fragment. The PCR products were digested with several restriction endonucleases.

Results. PCR analysis confirmed the presence of *Echinococcus* DNA in all cases. Restriction analysis showed identity with the G7 (pig) strain of *E. granulosus* in 8 isolates and *E. multilocularis* in 2 isolates.

Conclusions. Molecular analysis based on the PCR-RFLP method allowed to distinguish the isolates of *Echinococcus* and is a reliable tool for parasite detection and species or strain differentiation. The identification of *E. granulosus* G7 pig strain in most cases confirms its role as an aetiological agent of human cystic hydatic disease in Poland.