CELLULAR PRION LEVEL IN THE ANIMALS' TISSUES

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Prion infections or transmissible spongiform encephalopathies (TSE) are group of neurodegenerative diseases affecting humans and animals. The causative agent of prion infections is the pathological prion (PrP^{Sc}).

The precursor of pathological or infectious form is the cellular prion protein (PrP^{C}), which is encoded by the Prnp gene. A key event in the pathogenesis of TSE is the conformational transformation of the PrP^{C} into a PrP^{Sc} protease-resistant form. Experimental data confirm that PrP^{C} plays a major role in the replication of prions and prion-induced neurodegeneration.

Detection of cellular prion and identification of its isoforms in animal tissues are important for the scientific understanding of pathogen distribution mechanisms. It is also necessary for creation of methods for prion infections diagnosis, in particular bovine spongiform encephalopathy.

The aim of this study was to determine the level of PrP^{C} in brain, spleen, small intestine of laboratory rats, laboratory mice and cows.

The research was carried out on the males of white non-linear mice *Mus Musculus* and laboratory rats *Rattus norvegicus* var. *alba*, *Wistar* line, which were held under standard vivarium conditions. The laboratory animals were decapitated under ether anesthesia, the brain, spleen, small intestine were selected for this research. Cattle of black and white dairy breed were used for the researches too. The same tissues were taken from the cattle after the slaughtering. A western blotting analysis of the tissues was carried out.

PrP^{C} was found in different tissues and organs of the cattle, rats and mice. Using a western-blot analysis three forms of cellular prion were found in the tissues of cattle and rats. They includes the diglycosylated form (35–38 kDa), partially (mono) glycosylated form (23–27 kDa) and nonglycosylated form (19–21 kDa). Two forms of cellular prion (glycosylated (29 kDa) and nonglycosylated (19kDa) were observed in mice tissues.

In relation to PrP^{C} glycoforms in cattle brain and spleen the diglycosylated forms predominated and were 62 % and 66 %, respectively. Nonglycosylated form was represented in the low amount. It was 18 % in cattle brain and 11 % in cattle spleen. However, in the small intestine of cows the ratio of glycoforms of cellular prion was different. In this tissue part of nonglycosylated isoform was 67 %, monoglycosylated form — 20 % and diglycosylated form was presented at the lowest level — 13 %.

In rats' tissues the ratio of PrP^{C} glycoforms was the same as in cattle brain and spleen. The level of nonglycosylated isoform was the lowest in brain — 10 % and the highest level was in small intestine — 19 %. In brain tissue the level of di- and monoglycosylated forms was almost even identical 47 and 49 %, respectively.

In mice' tissues glycosylated forms were predominated. Its content was 60 %, 70 % and 58 % respectively in brain, spleen and small intestine. The lowest level of nonglycosylated isoform was found in spleen — 30 % and the highest level was in small intestine — 42 %.

Cellular prion is synthesized in brain, spleen and small intestine of cattle and laboratory animals. This confirms the involvement of these organs in the development of prionopathy and explains the mechanism of the pathogen spreading in case of infection.