

RESEARCH REPORT - No. 1101 FY 2011–2013

Title of research project	Study about the virulence of the particular serovars of <i>Listeria monocytogenes</i> isolates, and the consideration about the vaccination effect of the host.
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【Abstract】

Listeria monocytogenes : LM is a bacterium that causes listeriosis, a disease that may result in severe consequences for particular groups of the population. LM can be found throughout the environment and is often detected in food. In the ready to eat food which we do not heat-treat before eating it, LM is detected in an average of approximately 2% of domestic retail food in Japan.

Japanese people are assumed to be exposed to LM through food consumption comparison with western and other developed countries since Japanese have a food habits of eating raw food, and many kind of the ready to eat food. On the other hand, the number of patients of the LM of our country is estimated to be about 200 people a year, which is considerably low compared to the other developed countries.

Human listeriosis in Japan is mainly associated with serovars 1/2a, 1/2b and 4b. In this study, we evaluated the pathogenicity of the LM strains and clarified the existence of the highly pathogenic isolates using gerbils as the infection model animal which has intestinal epithelia cells resemble to that of humans and has the invasion mechanism of LM similar to humans.

We evaluated pathogenicity about large number of LM isolates of various origins. Serovar 4b was highly pathogenic, and most of the isolates which belong to 4b seemed to be highly pathogenic. In the examination of serovars 1/2a and 1/2b, a part of these strain were found to be highly pathogenic. The other serovar such as 1/2c which was often isolated from food and environment was hardly pathogenic.

Pathogenicity of LM is not uniform across strains, and some LM serovars are more virulent than others. This may be attributed to differences in the expression of virulence factors which could influence the interactions between the bacterium and the host. There are large differences in virulence between LM serovars. These results suggested that it is important how to controll serovar 4b, and some highly pathogenic strains of serovars 1/2a and 1/2b.

In this study using gerbils, we showed that pre-exposure to the low levels of LM through intra-gastric intubation decreased the levels of LM in the spleen after the second challenge with high levels of LM. This result demonstrated that a low level of LM contamination in food has a potential vaccination effect. We have to consider that such a vaccine effect affects the onset of the LM infection.