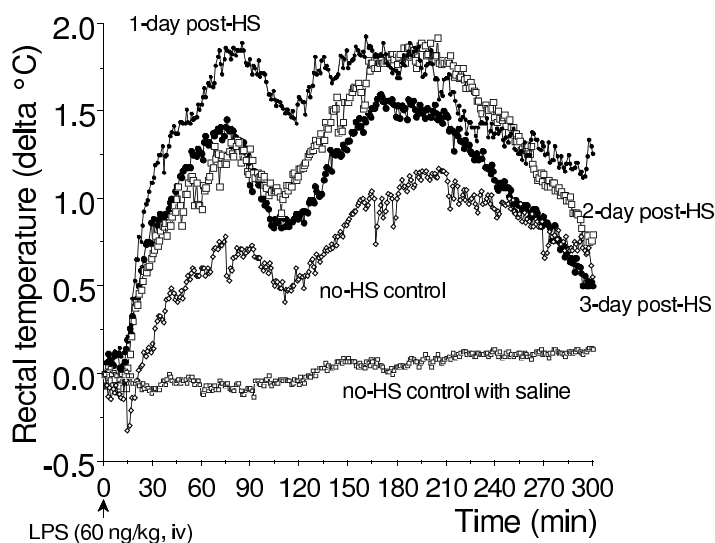


ENHANCED LPS-FEVER FOLLOWING HYPERTHERMIC STRESS IN RABBITS

M. Shibata¹, T. Uno¹, M. Kajihara¹, S. Ohkawara² and M. Yoshinaga², ¹Department of Biometeology, Yamanashi Institute of Environmental Sciences, Yamanashi, 403 - 0005, Japan and ²Department of Pathology, Kumamoto University School of Medicine, Kumamoto, 860 - 0851 Japan.

Whether higher than normal body temperature is beneficial or detrimental to animals and humans is a matter of debate. The reason for this debate is unclear. However, the conflicting results seem to come from different experimental conditions used, e.g., magnitude of hyperthermia, duration of hyperthermic condition, etc. In the present experiments, we attempted to examine a question whether and how hyperthermia affects host defense responses induced by endotoxin lipopolysaccharide (LPS, *Escherichia coli* 011:B4) using male Japanese white rabbits. Animals were made hyperthermic (rectal temperature, T_{rec}, of 43°C) by placing them in a hot chamber for 2-3 h. They were then removed from the chamber and made to recover under a room temperature of 25°C. Three groups of heat stressed (HS) animals were prepared: 1 - day, 2 - day and 3 - day post - HS. These animals together with non - HS control animals were given LPS (60 ng/kg, iv) and T_{rec} was monitored. Animals of 1 - day, but not 2 - day and 3 - day post - HS, showed significantly larger LPS fever (28.5% in terms of fever index) than those of controls (see the Figure). However, there was no difference in fever index between 1 - day post - HS and control animals when fever was induced by interleukin - 1 β (240 ng/kg, iv). There was also no difference in levels of the cerebrospinal fluid prostaglandin E₂ between 1 - day post - HS and control animals. A higher count of circulating neutrophils was observed in 1 - day, but not 2 - day and 3 - day post - HS animals. Levels of plasma tumor necrosis α during LPS fever were higher in 1 - day post - HS than control animals. These results indicate that the enhanced LPS fever observed in 1 - day post-HS animals may be caused by altered circulating neutrophils. They also implicate the possibility that 1 - day post - HS animals may be more susceptible to infections than control animals.



mshibata@yies.pref.yamanashi.jp