**Laboratory findings of Anaplasmosis in human patients from South Korea**

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**Introduction:** Human Granulocytic Anaplasmosis (HGA) is caused by the obligate intracellular bacterium of Anaplasma phagocytophilum which is mediated by mainly Haemaphysalis spp. or Ixodes spp. ticks. Here, we report the laboratory findings including the isolation of A. phagocytophilum from the anaplasmosis patient.

**Materials & Methods:** Totally 201 cases of the acute and convalescent blood samples were collected from the suspected HGA patient in 2015. Serologic test(IgG and IgM) of A. phagocytophilum was performed using IFA (serological positive cutoff of the kit was 1:80 for IgG and 1:16 for IgM). Peripheral bloods smear was performed to observed A. phagocytophilum morulae within monocytes and neutrophils. Genetic detection was performed by PCR amplification of A. phagocytophilum specific genes. Culture for isolation of A. phagocytophilum was performed by inoculating patient’s bloods or buffy coats into human promyelocytic cell line (HL-60).

**Results:** In serological tests using IFA, 14 of the 201 cases were detected IgG or IgM for A. phagocytophilum and 3 of 9 cases which had convalescent sera showed seroconversion. Three of the 118 cases which had blood specimen showed positive result of PCR. Cultivation and isolation was succeeded in 2 patients through cell culture using patient blood or buffy coats. Two patients, 61-year old woman and 75-year old woman were presented to hospital with acute fever and myalgia. They had experiences of having been exposed or bitten by the tick before illness. They were confirmed by observation of morulae and gene amplification for specific genes (16S rRNA, ankA and msp2, groESL) of A. phagocytophilum from acute blood samples.

**Conclusion:** This describes laboratory findings from HGA suspected patient who had fever with a recent history of tick bites or outdoor activity. From this result it is considered to be tested with IFA as well as PCR and peripheral blood smears when patients are suspected with tick-borne illness, especially anaplasmosis. We expect that the clinical isolates from this study may play a role as a reference strain for research of HGA in Korea.

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**Immune responses to fusion antigen OTBS56-47 based on the major antigens of Orientia tsutsugamushi causing scrub typhus**

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**Background:** Scrub typhus is an acute, febrile, and potentially fatal mite-borne disease that is caused by infection with Orientia tsutsugamushi. In Korea, the incidence has increased due to environmental changes and increased outdoor activity leading to frequent exposure to chigger mite vectors. Although the infection is treatable with doxycycline and azithromycin, an effective prophylactic vaccine against O. tsutsugamushi would be more favorable for preventing scrub typhus in the endemic areas.

**Materials and Methods:** We combined the immunoreactive regions of 47-kDa outer membrane protein (47-kDa OMP) and 56-kDa type-specific antigen (TSA56) to generate a conventional subunit vaccine expressing recombinant OTBS56-47 (recOTBS56-47) and a DNA vaccine (pOTBS56-47). We evaluated two types of vaccination, intranasal immunization with recOTBS56-47, and Intramuscular immunization with pOTBS56-47 for immunogenicity and efficacy.

**Results:** In mice, intranasal immunization with recOTBS56-47 plus cholera toxin (CT) was the most effective method for the induction of humoral and cell-mediated immune responses; it induced a strong cellular immune response, as demonstrated by a spleen cell proliferation assay, and induced a higher amount of recOTBS56-47-specific antibodies. Intramuscular immunization with pOTBS56-47 alone, or pOTBS56-47 plus adjuvant pmIL-2, induced a low level of humoral immune response.

**Conclusion:** OTBS56-47 is an attractive candidate for developing a prophylactic vaccine against scrub typhus caused by O. tsutsugamushi.

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