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Distinct by different laboratory results between scrub typhus and malaria

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Background:

Distinguishing diagnosis of scrub typhus from other acute undifferentiated fever illnesses, such as malaria, dengue fever, and viral hemorrhagic fever, is usually difficult because of their similar manifestations in Asian countries. Among them, scrub typhus and malaria are frequently reported in many rural areas. Clinically, it is difficult to distinguish both diseases at the early stages of illness. To obtain simple and useful indices for distinguishing scrub typhus and malaria at the early stages, we collected and compared routine laboratory data at the time of admission.

Material/methods:

Malaria was diagnosed when malaria parasites were detected by the microscope examination of blood. Scrub typhus was confirmed at first if specific IgG titers were >1:256, or if 4-fold increased titers were demonstrated with paired serum specimens in an indirect immunofluorescence antibody (IFA) test. We compared the laboratory findings of acute scrub typhus with those of Malaria at presentation. This retrospective study was conducted in Wonkwang University Hospital and Chonbuk National University Hospital in Korea between January 2000 and December 2015.

Results:

312 patients (18-60 years of age) with scrub typhus and 139 patients (18-60 years of age) with malaria (all vivax malaria) were included in the study. The mean ages of the patients was 51.9 years in the scrub typhus group and 25.9 years in the malaria group ($P < 0.001$). The hemoglobin level and the platelet counts were significantly higher in the scrub typhus group than in the malaria group ($P < 0.001$). After log-transformation of variables, WBC counts and liver function tests (AST, ALT and ALP) were significantly different between two group (Table 1). The counts of platelets, serum ALT levels was higher in the scrub typhus group (Figure 1).

Conclusions:

The hemoglobin level, WBC counts, platelet counts, and liver function tests were significantly different between scrub typhus and malaria. The most distinct differential laboratory data was platelet, serum AST/ALT, which was higher in scrub typhus than in malaria.

Table 1. Laboratory findings in scrub typhus and malaria

	Scrub typhus (N=312)	Malaria (N=139)	<i>p</i> -value
Age y, mean (SD)	51.9 ± 11.2	25.9 ± 9.1	0.001
Male (%)	146 (46.8)	129 (93.5)	0.001
Laboratory findings			
Hemoglobin (g/dL)	12.6 ± 1.8	11.2 ± 2.0	0.001
Platelet(/mm ³)	133,172 ± 60,278	55,275 ± 34,765	0.001
Bilirubin (mg/dL)	1.03 ± 2.89	2.73 ± 3.33	0.001
Albumin (g/dL)	3.5 ± 0.5	3.3 ± 0.5	0.001
Log transformed variables			
WBC (/mm ³)	8.89 ± 0.63	8.75 ± 0.39	0.006
AST (IU/L)	4.60 ± 0.84	4.02 ± 0.69	0.001

ALT (IU/L)	4.44 ± 0.92	4.16 ± 0.75	0.001
ALP (IU/L)	5.77 ± 0.60	5.10 ± 0.64	0.001

Figure 1. Distribution of ALT levels and platelet count in the scrub typhus group (1) and in malaria group (2)

