



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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The clinical implication of visceral to subcutaneous fat ratio in scrub typhus patients with acute kidney injury

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Objectives : Visceral to subcutaneous adipose tissue (VS) ratio is reported to be helpful to predict the development of acute kidney injury (AKI). However, there is no study about the relationship between computed tomography (CT)-measured adiposity and scrub typhus-associated AKI. We aimed to investigate whether VS ratio assessed by CT was able to predict the development of AKI in patients with scrub typhus.

Methods : Between 2009 and 2024, 683 patients were diagnosed with scrub typhus at Presbyterian Medical Center. Of these, we included 300 patients who underwent CT in our study. Subcutaneous adipose tissue and visceral adipose tissue areas were quantified at the L4-L5 level from abdominal CT scans. We divided the enrolled patients into two groups [low VS ratio (Low-VS, N=146) vs. high VS ratio (High-VS, N=154)] based on the VS ratio of 0.65 and compared clinical characteristics between the two groups.

Results : Compared to patients in the Low-VS group, patients in the High-VS group were older (63.1 vs. 63.9 years, $P<0.001$) and had one or more comorbidities such as hypertension (35% vs. 51%, $P=0.017$) and diabetes (9.6% vs. 29.2%, $P<0.001$). The patients in the High-VS group had higher incidence of complications in respiratory and cardiovascular system. Furthermore, AKI developed significantly more in patients in the High-VS group (19.9% vs. 33.1%, $P<0.02$) as compared to the Low-VS group. The overall incidence of AKI was 26.7%; of which, 18.0%, 7.7%, and 1.0% cases were classified as Risk, Injury, and Failure, respectively. In a multivariate logistic regression analysis for predicting AKI, age, presence hypertension and VS ratio were significant predictors for AKI.

Conclusions : The VS ratio is helpful to predict the development of AKI in patient with scrub typhus.

Table 1.png



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	Low-VS (n=146)	High-VS (n=154)	P-value
Age	63.1 ± 14	68.9 ± 11	< 0.001
Male, n(%)	65 (45)	83 (54)	NS
DM, n(%)	14 (9.6)	45 (29.2)	< 0.001
Hypertension, n(%)	48 (35)	70 (51)	0.017
CKD, n(%)	3 (2.1)	5 (3.3)	NS
Hemoglobin (mg/dl)	12.4 ± 1.5	12.5 ± 1.8	NS
Complications			
Gastrointestinal tract, n (%)	36 (24)	24 (14)	NS
Respiratory system	27 (19)	49 (32)	0.006
Cardiovascular system	23 (16)	45 (29)	0.03
Central nervous system	2 (1.4)	5 (3.2)	NS
Acute kidney injury	29 (20)	51 (33)	0.007
Leukocyte (×10 ³ / mL)	7.5 ± 3.8	8.2 ± 4.4	NS
Platelet count (×10 ³ / mL)	134± 56	140 ± 48	NS
Serum albumin (mg/dl)	3.5 ± 0.6	3.4 ± 0.7	NS
Serum ALT (IU/L)	135 ± 195	125 ± 100	NS
Creatinine (mg/dl)	1.0 ± 0.5	1.2 ± 0.6	0.02

Table 1.png

	Univariate		Multivariate	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Age	1.062 (1.037-1.087)	<0.001	1.048 (1.021-1.075)	<0.001
DM	1.876 (1.025-3.434)	0.041	1.088 (0.555-2.136)	NS
Hypertension	3.725 (2.181-6.364)	<0.001	2.513 (1.389-4.547)	0.002
VS ratio	2.907 (1.571-5.379)	0.001	2.335 (1.233-4.421)	0.009



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