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Paper Poster Session

Influenza - clinical epidemiology

Comparison of procalcitonin and C-reactive protein to predict intensive care unit admission with hospital-admitted influenza patients

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Background: During the last few years, an inflammation peptide, procalcitonin (PCT) was introduced in the clinical practice. It is a common concept that viral infection has more tendency of normal PCT value than bacterial infection. We aimed to know the usefulness of PCT in the influenza infection.

Material/methods: A nation-wide network called Hospital-based Influenza Morbidity & Mortality (HIMM) in South Korea consist of 10 hospitals, and collects prospectively clinical data and sputum from the patients with influenza like illness (ILI). We used the HIMM database between Oct. 2011 and Apr. 2015. ILI was defined as an acute respiratory infection with measured fever of ≥ 38 °C and a cough that occurred within 7 days. Influenza was confirmed using influenza polymerase chain reaction (PCR) or rapid influenza test in nasopharyngeal sample. We enrolled 984 influenza patients who were assessed a PCT value at initial hospital admission. We compared PCT with CRP in admitted influenza patients who are requiring intensive care unit (ICU) care or not.

Results: We analyzed 124 ICU and 860 ward admission patients. Shock (aOR and 95% CI 11.1, 4.5 - 27.1, $p < 0.001$), azotemia (4.4, 1.7 – 11.3, $p = 0.002$), hypoxemia (2.7, 1.5 – 4.9, $p = 0.001$) were

associated with ICU admission in the multivariate logistic regression test. Pneumonia did not reach to statistical significance (2.7, 1.0 - 7.4, $p = 0.054$). PCT and CRP values are significantly higher in the ICU patients (CRP; 128.1 ± 99.2 , 69.3 ± 70.1 mg/L, $p < 0.001$, PCT; 11.76 ± 30.19 , 1.91 ± 6.98 $\mu\text{g/L}$, $p = 0.005$, in ICU and in non-ICU, respectively). However, discriminating power for suggesting severe influenza requiring ICU admission was more in PCT with the statistical value in just above to higher (>0.05 , >0.5 , >2 , >20 $\mu\text{g/L}$)(Table).

Conclusions: High CRP or PCT in hospitalized influenza means severe illness. Additionally, PCT might be a more sensitive marker for severe influenza infection than CRP. We think a high PCT value may have a role in suggesting more intensive care and evaluation of complications.

Keywords: Influenza, C-reactive protein, Procalcitonin

Table. C-reactive protein and procalcitonin level in the ICU admission patients

	Discriminating value	p-value ^a .	OR (95% CI)	ICU admission	
				Yes (% ^b)	No (% ^c)
CRP (mg/L)	>5	0.236	1.9 (0.7 – 5.2)	120 (96.8)	793 (94.2)
	>50	<0.001	2.9 (2.0 – 4.4)	88 (71.0)	382 (45.4)
	>100	<0.001	3.6 (2.5 – 5.3)	68 (54.8)	211 (25.1)
Procalcitonin (µg/L)	>0.05	<0.001	15.6 (2.1 – 113.8)	78 (98.7)	331 (83.4)
	>0.5	<0.001	4.9 (2.9 – 8.2)	52 (65.8)	112 (28.2)
	>2	<0.001	4.9 (2.9 – 8.3)	36 (45.6)	58 (14.6)
	>20	<0.001	7.9 (3.1 – 20.3)	11 (13.9)	8 (2.0)

^aChi-square test, ^b% of total ICU admission patients, ^c% of total non-ICU admission patients.

