RES-244

Usefulness of Presepsin as a Biomarker for Sepsis: A One-year Clinical Diagnosis Review

Kyoung Ho Roh[1], M.D.,Ph.D.*

Department of Laboratory Medicine, National Health Insurance Ilsan Hospital, Goyang[1], Republic of Korea

http://www.nhimc.or.kr

INTRODUCTION

Sepsis remains a leading cause of morbidity and mortality worldwide, demanding prompt diagnosis and effective management. Presepsin, a soluble subtype of the CD14 receptor, has emerged as a promising biomarker for early sepsis detection and prognostic evaluation. Recent studies highlight the diagnostic utility of presepsin in critically ill patients, demonstrating its correlation with sepsis severity, organ dysfunction, and patient outcomes. Compared to traditional biomarkers such as procalcitonin (PCT) and C-reactive protein (CRP), presepsin offers faster kinetics, enabling earlier detection. We reviewed the usefulness of presepsin for one year at one teaching hospital in Korea.

PURPOSE

We reviewed the EMR (electric medical record) for usefulness of presepsin for 1 year at one teaching hospital in Korea.

METHODS

The PATHFAST Presepsin (PHC corporation, Japan) IVD certified by the Ministry of Food and Drug Safety (MFDS) was implemented by the manufacturer's instructions. The limit of detection (LoD) and precision were tested with the serially diluted quality control samples with diluents before the implementation. For quantitative report, below 300 pg/mL was negative and above 500 pg/mL was positive. Between value (300-500 pg/mL) was reported as equivocal. From July 2024 to June 2025, we collected the presepsin results, sex, age, department of clinician and clinical diagnosis. Sepsis related diagnosis were counted with the results of presepsin.

TABLES

Table 1. The presepsin using medical department and percent of sepsis related diagnosis.

Department	Sepsis related	(%)	Non-related	(%)	Total	(%)
Emergency Medicine	210	5.9%	3,328	94.1%	3,538	91.1%
General Surgery	16	7.7%	193	92.3%	209	5.4%
Nephrology	2	2.2%	91	97.8%	93	2.4%
Hemato-oncology		0.0%	20	100.0%	20	0.5%
Orthopedics Surgery		0.0%	8	100.0%	8	0.2%
Family Medicine		0.0%	4	100.0%	4	0.1%
Infectious Diseases	2	66.7%	1	33.3%	3	0.1%
Neurology	1	50.0%	1	50.0%	2	0.1%
Gastroenterology		0.0%	2	100.0%	2	0.1%
Endocrinology		0.0%	2	100.0%	2	0.1%
General Internal Medicine		0.0%	1	100.0%	1	0.0%
Rehabilitation Medicine		0.0%	1	100.0%	1	0.0%
Rheumatology		0.0%	1	100.0%	1	0.0%
Neurosurgery		0.0%	1	100.0%	1	0.0%
Total	**231**	**5.9%**	**3,654**	**94.1%**	**3,885**	**100.0%**

TABLES

Table 2. The presepsin testing patients by age groups and sepsis related diagnosis.

	Sepsis related					Sepsis non-related				
Age group	M		F		Sub total	M		F		Sub total
10-19						5	41.7%	7	58.3%	12
20-29						43	41.0%	62	59.0%	105
30-39	1	50.0%	1	50.0%	2	67	49.6%	68	50.4%	135
40-49	2	100.0%			2	101	57.1%	76	42.9%	177
50-59	12	70.6%	5	29.4%	17	189	58.7%	133	41.3%	322
60-69	25	67.6%	12	32.4%	37	355	63.8%	201	36.2%	556
70-79	23	45.1%	28	54.9%	51	393	54.4%	329	45.6%	722
80-89	38	37.3%	64	62.7%	102	587	44.9%	721	55.1%	1,308
90-99	9	45.0%	11	55.0%	20	105	34.5%	199	65.5%	304
100-109						6	46.2%	7	53.8%	13
Total	**110**	**47.6%**	**121**	**52.4%**	**231**	**1,851**	**50.7%**	**1803**	**49.3%**	**3,654**

Table 3. The presepsin level and increasing diagnostic rate of sepsis

Presepsin level	Sepsis related		Sepsis non-related		Total	
0-100			63	100.0%	63	1.6%
100-200	6	1.4%	426	98.6%	432	11.1%
200-300 Negative	15	2.5%	585	97.5%	600	15.4%
300-400	13	2.5%	508	97.5%	521	13.4%
400-500 Equivocal	13	3.1%	413	96.9%	426	11.0%
500-600 Positive	19	5.9%	303	94.1%	322	8.3%
600-700	20	8.2%	223	91.8%	243	6.3%
700-800	19	9.8%	174	90.2%	193	5.0%
800-900	11	8.0%	127	92.0%	138	3.6%
900-1000	12	9.8%	110	90.2%	122	3.1%
1000-1100	13	13.8%	81	86.2%	94	2.4%
1100-1200	7	9.9%	64	90.1%	71	1.8%
1200-1300	10	15.9%	53	84.1%	63	1.6%
1300-1400	9	19.1%	38	80.9%	47	1.2%
1400-1500	3	5.8%	49	94.2%	52	1.3%
1500-1600	3	9.1%	30	90.9%	33	0.8%
1600-2000	11	11.2%	87	88.8%	98	2.5%
2000-2400	10	12.8%	68	87.2%	78	2.0%
2400-2800	9	17.0%	44	83.0%	53	1.4%
2800-3200	6	15.0%	34	85.0%	40	1.0%
3200-3600	2	7.7%	24	92.3%	26	0.7%
3600-4000	2	8.3%	22	91.7%	24	0.6%
4000-4400	3	15.8%	16	84.2%	19	0.5%
4400-4800	3	20.0%	12	80.0%	15	0.4%
4800-5200	1	16.7%	5	83.3%	6	0.2%
>5200	11	10.4%	95	89.6%	106	2.7%
Total	**231**	**100%**	**3,654**	**100%**	**3,885**	**100%**

Table 4. The detail diagnosis of sepsis related patients

Diagnosis	M		F		Total
Septic shock	69	58.5%	49	41.5%	118
Shock	9	31.0%	20	69.0%	29
Sepsis(septicemia)	15	53.6%	13	46.4%	28
Sepsis due to Escherichia coli[E.coli]	3	16.7%	15	83.3%	18
Other specified sepsis	2	18.2%	9	81.8%	11
Severe sepsis	3	33.3%	6	66.7%	9
Hypovolemic shock	4	100.0%		0.0%	4
Sepsis due to Staphylococcus aureus		0.0%	3	100.0%	3
septic arthritis, knee		0.0%	2	100.0%	2
Sepsis due to klebsiella	1	50.0%	1	50.0%	2
Biliary sepsis	1	50.0%	1	50.0%	2
Others	3	60.0%	2	40.0%	5
Total	**110**	**47.6%**	**121**	**52.4%**	**231**

FIGURES

Cardiac Markers	cTn I , Myoglobin, CK-MB, NT-pro BNP, hs-CRP
DVT(Deepvein Thrombosis)/ PE(Pulmonary Embolism)	D-Dimer
Sepsis	Presepsin
Fertility assay	β -hCG, HCG preg, LH, FSH, Prolactin, Estradiol

Fig. 1. The PATHFAST IVD and presepsin cartridge.

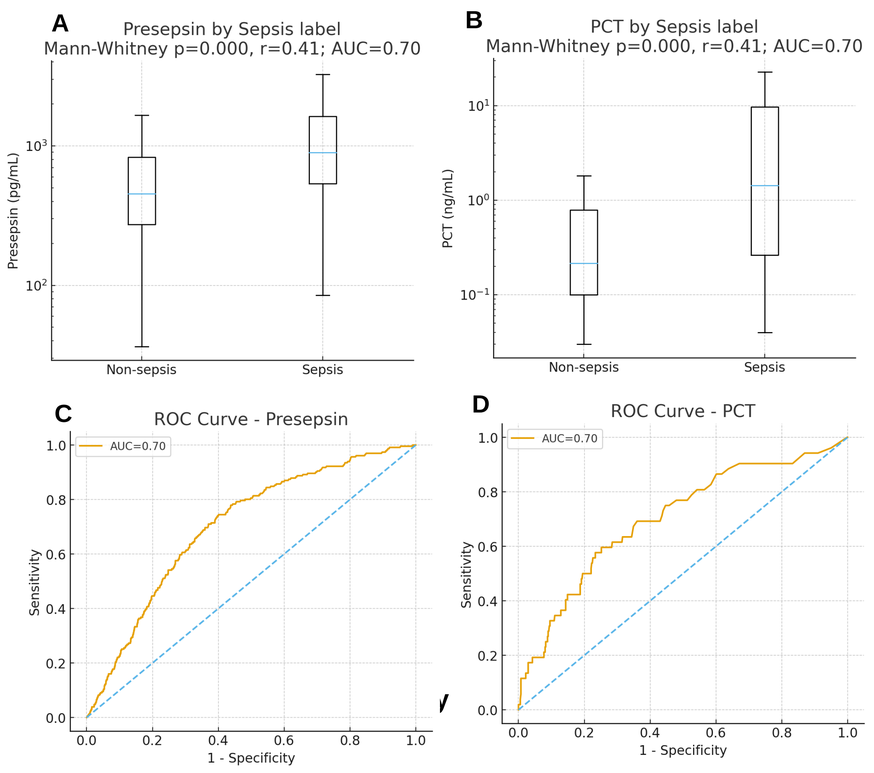

Fig. 2. The presepsin (A) and procalcitonin (B) level by sepsis related diagnosis, presepsin ROC curve (C), PCT ROC curve (D).

RESULTS

A total 3,885 presepsin tests were done during the study period 1,961 male and 1,924 female. Average age was 70.6 for male and 73.9 for female group. Most common presepsin using department was emergency medicine (91.1%), and next was general surgery (5.4%). The number of positive, equivocal and negative were 1,843, 947, 1,095 patients respectively. Sepsis related diagnosis rates were different by presepsin result groups. The negative and equivocal groups only had 3.8% and 3.7% clinical diagnosed as sepsis related conditions. However, the positive group demonstrated 11.1% patients was diagnosed as sepsis. As increased positive cut off from 500 to 700 or 1,000 pg/mL, the positive rate were increased to 13.7% and 16.5% respectively. ROC analysis showed the best threshold was 563 pg/mL.

CONCLUSIONS

Presepsin demonstrated clinical utility as a supportive biomarker for early sepsis detection, particularly in emergency settings. Use of higher cutoff thresholds may enhance diagnostic specificity without compromising early identification.