Evaluation of a new tool in diagnostic process of sepsis: reporting results to a smartphone

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Background: A pilot study(PS) was designed to change on of antibiotic treatment in patients with sepsis-code, results of Antimicrobial-Susceptibility-Testing(AST) performed using Accelerate Pheno(Accelerate-Diagnosis) was reporting to smartphone by means of institutional email and Electronic-Clinical History(HCIS).

Materials/methods: 7 clinical services collaborate in these study (intensive care unit, internal-infectious medicine, emergency, digestive, resuscitation, general surgery, microbiology). 58 septic patients with positive blood cultures(BC+) were included, from May-November 2019. In PS 24 patients were included whereas the other 34 were admitted to non-participating services, constituted as Control-Group(CG). Data of treatment changes were collected in each phases of results reported of BC+ process: Gram stain, a Maldi-Tof(Bruker-Daltonics) identification, ID/AST by Accelerate-Pheno(ACC-AST) and AST by MicroScan-Walkaway(Beckman-Coulter). Treatment modifications at each stage were collected and evaluated according to next criteria: Escalation, De-escalation, Equivalent.

Results: There were 57 modifications on treatment of 39 (67,2%) patients: 16 Escalations, 36, de-escalation and 5 Equivalent, as shown on Table 1

Adequations on treatment	Gram stain (n=58)	MALDI-TOF-identification (n=58)	ACC-AST (n=58)			Micro-SCAN-AST (n=58)	Total actions 57
			PS(n=24)	CG(n=34)	Global ACC-AST (n=58)		
Escalation(%)	13(76,5)	1(25)	3(33,3)	3(37,5)	6(35,3)	6(31,6)	26
De-escalation(%)	3(17,6)	2(50)	6(66,7)	4(50)	10(58,8)	11(57,9)	26
Equivalent(%)	1(5,9)	1(25)	-	1(12,5)	1(5,9)	2(10,5)	5
Total treatment adequation (%)	Gram stain (n=58) 17(29,3)	MALDI-TOF-identification (n=58) 4(6,9)	ACC-AST (n=58)			Micro-SCAN-AST (n=58) 19(33,3)	Total actions 57
			PS(n=24) 9(37,5)*	CG(n=34) 8(23,5)*	Global ACC-AST (n=58) 17(29,3)		
Treatment First modification	17	3 (1DE; 1ES; 1EQ)	4 (3DE, 1ES)	6 (3DE; 2ES; 1EQ)	10 (6DE; 3ES; 1EQ)	9 (6DE; 3ES)	39
Treatment Second Modification		1 (DE)	5 (3DE; 2ES)	2 (1DE; 1ES)	7 (4DE; 3ES)	6 (4DE; 1ES; 1EQ)	14
Treatment Third modification						4 (1DE; 2ES; 1EQ)	4

Table 1. DE=De-escalation; ES=Escalation; EQ=Equivalent

Comparing changes in treatment between both, PS and CG groups, when ACC-AST were reported, no significant differences were found (p=0,25). It is possible due to small sample size.

Conclusions: Use of fast Identification/AST devices has an important impact in antibiotic management of patients with severe infections or sepsis and use of mobile device to receive and analyze AST results on real time and in point of care is a good strategy for a rational use of antimicrobials

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