

Online supplement

Procalcitonin to reduce exposure to antibiotics during acute chest syndrome in adult patients with sickle cell disease. PROSTA study

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Table S1. Baseline characteristics of 100 patients with acute chest syndrome according to PCT-group.

Parameter	All patients (n=100)	Study period		<i>p</i> value
		Control (n=41)	Intervention (n=59)	
Age, years	31 [26-36]	29 [26-37]	32 [27-36]	0.7
Male gender	53 (53)	26 (63)	27 (46)	0.08
Weight, kg	65 [57-74]	65 [57-75]	64 [57-74]	0.9
Height, cm	173 [168-178]	174 [169-180]	172 [168-176]	0.2
Baseline total Hb, g/dl	9.0 [8.0-9.7]	8.5 [8.0-9.0]	9 [8.0-10.0]	0.3
SS genotype	86 (86)	36 (88)	50 (85)	0.9
Past medical history:				
Previous ACS	80 (80)	34 (83)	46 (78)	0.5
Previous VOC	98 (98)	40 (98)	58 (98)	>0.99
Stroke	9 (9)	3 (7)	6 (10)	0.7
Retinopathy	12 (12)	4 (10)	8 (14)	0.8
Priapism ¹	11 (21)	6 (23)	5 (19)	0.7
Bone necrosis	27 (27)	13 (32)	14 (26)	0.4
Heart disease	14 (14)	6 (15)	8 (14)	0.9
Alloimmunization	16 (16)	5 (12)	11 (19)	0.4
Baseline treatments				
Transfusion therapy	4 (4)	3 (5)	1 (2)	0.6
Hydroxyurea treatment	43 (43)	15 (37)	28 (48)	0.3
Home oxygen therapy	6 (6)	5 (12)	1 (2)	0.04
Anti-pneumococcal vaccination	53 (53)	18 (46)	35 (59)	0.2

Data are presented as median [25th-75th percentiles] or number (percentage); Hb, hemoglobin; ACS, acute chest syndrome; VOC, vaso-occlusive pain crisis.

Table S2. Clinical and biological data at diagnosis and during hospital stay during 103 episodes of acute chest syndrome according to study period.

Parameter	All episodes (n=103)	Study period		p value
		Control (n=43)	Intervention (n=60)	
Type of precipitating factor				
VOC before ACS	80 (78)	35 (81)	45 (75)	0.4
Surgery	8 (8)	1 (2)	7 (12)	0.1
Infection	2 (2)	1 (2)	1 (2)	>0.99
Other	13 (13)	6 (14)	7 (12)	0.7
Symptoms				
Fever (T>38°C)	72 (70)	27 (63)	45 (75)	0.2
Chest pain	90 (87)	38 (88)	57 (87)	0.8
Extrathoracic pain during ACS	75 (73)	31 (72)	44 (73)	0.9
Cough	18 (21)	7 (21)	11 (22)	>0.99
Pulmonary crackles	93 (90)	39 (91)	54 (90)	>0.99
Jugular venous distension	6 (8)	2 (7)	4 (8)	>0.99
Mean blood pressure, mm Hg	93 [82-107]	101 [91-111]	89 [79-100]	<0.001
Heart rate, beats/min	98 [89-110]	98 [86-112]	98 [90-110]	>0.99
Respiratory rate, breaths/min	24 [20-30]	25 [20-33]	24 [20-30]	0.2
Oxygen therapy, L/mn	3.0 [2.0-3.0]	3.0 [2.0-3.0]	3.0 [2.0-3.0]	0.5
Saturation, %	98 [95-99]	98 [96-100]	98 [94-99]	0.07
Acute cor pulmonale	9 (10)	5 (14)	4 (8)	0.5
Laboratory values at ACS diagnosis				
White cell count, 10 ⁹ /L	15.1 [10.9-18.2]	16.7 [11.3-21.2]	14.5 [9.9-17.2]	0.1
Platelet count, 10 ⁹ /L	295 [211-393]	314 [212-440]	289 [210-343]	0.2
Total hemoglobin, g/dL	8.2 [6.9-9.5]	8.1 [6.3-9.5]	8.3 [7.1-9.5]	0.6
Lactate dehydrogenase, IU/L	492 [347-663]	546 [369-736]	432 [309-634]	0.02
Maximum C-reactive protein, mg/L	100 [40-160]	109 [62-164]	84 [38-171]	0.3
Procalcitonin at ACS diagnosis, µg/l	0.22 [0.11-0.6]	0.2 [0.15-0.46]	0.2 [0.1-0.7]	0.7

Data are presented as median [25th-75th percentiles] or number (percentage). T, temperature; ACS, acute chest syndrome; VOC, vaso-occlusive pain crisis.

Table S3. Characteristics of the 103 episodes of acute chest syndrome, according to procalcitonin level on day 1 to 3.

Parameter	All episodes (n=103)	PCT level (day 1, 2 and 3)		<i>p</i> value
		≥ 0.5µg/L (n=37)	< 0.5µg/L (n=66)	
Symptoms at ACS diagnosis				
Fever (T>38°C)	72 (70)	34 (92)	38 (58)	<0.001
Chest pain	90 (87)	31 (84)	59 (89)	0.5
Extrathoracic pain during ACS	75 (73)	28 (76)	47 (72)	0.6
Oxygen therapy > 3L/mn	19 (18)	10 (27)	9 (14)	0.09
Laboratory values at ACS diagnosis				
White cell count, 109/L	15.1 [10.9-18.2]	17.2 [13.3-23.2]	13.2 [10.4-17.0]	0.004
Platelet count,109/L	295 [211-393]	272 [178-349]	307 [227-415]	0.09
Total hemoglobin, g/dL	8.2 [6.9-9.5]	8.3 [7.2-9.5]	8.1 [6.9-9.5]	0.9
Lactate dehydrogenase, IU/L	492 [347-663]	619 [374-1007]	466 [326-594]	0.003
Maximum C-reactive protein, mg/L	100 [40-160]	174 [100-261]	81 [39-130]	0.003
Procalcitonin at ACS diagnosis, µg/l	0.2 [0.1-0.6]	0.7 [0.5-4.2]	0.2 [0.1-0.2]	<0.001
Exchange and single transfusion <day 3	45 (44)	22 (60)	23 (35)	0.02
Antibiotic duration	7 [5-8]	7 [6-11]	7 [3-8]	0.007
Invasive mechanical ventilation	3 (3)	2 (5)	1 (2)	0.3
ICU admission	47 (46)	23 (62)	24 (36)	0.01
SAPS II	12 [6 -18]	18 [8 -21]	10 [6 -15]	0.009
SOFA score	3.0 [2.0-4.0]	4.0 [2.5-5.0]	3.0 [1.8-4.0]	0.002
Length of hospitalization, days	7.0 [6.0-12.0]	11.0 [7.0-14.0]	7.0 [5.0-10.0]	0.002
Re-hospitalization	5 (5)	2 (5)	3 (5)	> 0.99
In-hospital death	1 (1)	1 (3)	0 (0)	0.4

Data are presented as median [25th-75th percentiles] or number (percentage); VOC, vaso-occlusive crisis; ACS, acute chest syndrome; ICU, intensive-care unit; SAPS II, simplified acute physiological score; SOFA, sequential organ failure assessment.

Table S4. Characteristics of the 63 episodes of acute chest syndrome, included in intervention phase, according to algorithm compliance.

Parameter	All episodes (n=60)	Antibiotic discontinuation		p value
		Earlier or according to protocol (n=37)	Prolonged duration (n=23)	
Age, years	32 [27-36]	32 [27-38]	32 [26-35]	0.9
Male gender	27 (45)	16 (43)	11 (48)	0.7
SS genotype	51 (85)	33 (89)	18 (78)	0.5
Previous ACS	47 (78)	26 (70)	21 (91)	0.1
Previous VOC	59 (98)	36 (97)	23 (100)	> 0.99
Type of precipitating factor				
VOC before ACS	45 (75)	25 (68)	20 (87)	0.1
Surgery	7 (12)	7 (19)	0 (0)	0.04
Infection	1 (2)	1 (3)	0 (0)	> 0.99
Symptoms				
Fever (T>38°C)	45 (75)	28 (76)	17 (74)	0.9
Chest pain	52 (87)	31 (84)	21 (91)	0.7
Extrathoracic pain during ACS	44 (73)	27 (73)	17 (74)	0.9
Cough	11 (22)	6 (20)	5 (24)	0.7
Pulmonary crackles	54 (90)	33 (89)	21 (91)	> 0.99
Mean blood pressure, mm Hg	89 [79-100]	85 [80-98]	91 [77-102]	0.7
Heart rate, beats/min	98 [90-110]	96 [82-107]	100 [91-118]	0.1
Respiratory rate, breaths/min	24 [20-30]	24 [20-28]	24 [20-38]	0.4
Oxygen therapy, L/mn	3.0 [2.0-3.0]	3 [2-4]	3 [2-3]	0.06
Oxygen therapy > 3L/mn	10 (17)	10 (27)	0 (0)	0.009
Saturation, %	98 [94-99]	98 [96-99]	95 [90-98]	0.006
Acute cor pulmonale	4 (8)	4 (12)	0 (0)	0.3
Laboratory values at ACS diagnosis				
White cell count, 109/L	14.5 [9.9-17.2]	15.3 [9.6-19.4]	14.4 [10.6-15.8]	0.4
Platelet count, 109/L	289 [210-343]	288 [210-344]	300 [204-345]	0.9
Total hemoglobin, g/dL	8.3 [7.1-9.5]	8.0 [7.0-9.5]	8.4 [7.4-9.5]	0.4
Lactate dehydrogenase, IU/L	432 [309-634]	431 [305-625]	433 [326-656]	0.9
Maximum C-reactive protein, mg/L	84 [38-171]	101 [36-191]	57 [38-148]	0.5
Procalcitonin at ACS diagnosis, µg/l	0.2 [0.1-0.7]	0.2 [0.1-0.9]	0.2 [0.1-0.5]	0.3
Exchange and single transfusion <day 3	16 (27)	10 (27)	6 (26)	0.9
Antibiotic duration	6 [3-7]	4 [2-7]	7 [5-9]	0.001
3 days or less antibiotics	18 (30)	18 (49)	0 (0)	<0.001
Proved infection	6 (10)	2 (9)	4 (11)	> 0.99
Antibiotics reintroduction	5 (8)	1 (3)	4 (17)	0.07
Invasive mechanical ventilation	1 (2)	1 (3)	0 (0)	> 0.99
Extra-pulmonary infection	2 (3)	0 (0)	2 (9)	0.1

ICU admission	22 (37)	14 (38)	8 (35)	0.8
SAPS II	11 [6 -20]	15 [6 -21]	9 [6 -13]	0.3
SOFA score	3.0 [2.0-4.0]	3.0 [1.5-4.0]	3.0 [2.0-4.0]	0.9
Length of hospitalization, days	8.0 [6.0-12.0]	8.0 [5.5-12.0]	7.0 [6.0-12.0]	0.9
Re-hospitalization	4 (7)	0 (0)	4 (17)	0.02
In-hospital death	1 (2)	1 (3)	0 (0)	> 0.99

Data are presented as median [25th-75th percentiles] or number (percentage); VOC, vaso-occlusive crisis; ACS, acute chest syndrome; ICU, intensive-care unit; SAPS II, simplified acute physiological score; SOFA, sequential organ failure assessment.