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Predictors of mortality of severe virus-associated community-acquired pneumonia using logistic regression analysis

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Background: Despite the fact that the influenza virus pathogenicity factors have been well studied in vitro, in vivo quite clear to the end the question remains just those risk factors, objective and laboratory parameters, which to a great extent related to the fatal virus-associated community-acquired pneumonia (CAP).

Material/methods: Objectives: to study the clinical and laboratory parameters of patients with severe virus-associated emergency during the 2015-2016 influenza epidemic and to determine their role as predictors of patients mortality. Methods: main group – 33 patients (mean age – 49.3±1.87 years, men – 18 (54.5%)) with severe virus-associated CAP, divided into two subgroups: subgroup A – 22 deaths from the virus-associated severe CAP, subgroup B – 11 patients with successful treatment of virus-associated severe CAP. General analysis, determination of RNA Influenza A(H1N1)-California, markers of systemic inflammation, statistic, including univariate analysis, Pearson χ^2 test, multifactorial analysis using logistic regression and determination diagnostic Wald's coefficients.

Results: In order to conclude which of these parameters have the greatest influence to the outcome of severe virus-associated CAP we done multifactorial analysis using module based on logistic regression in program Statistica. For this, the dependent factor was elected disease outcome (death/success) and as predictors of mortality were indicators that demonstrated significant difference between surviving and died patients according to univariate analysis [table1].

Table 1

Logistic regression results of patients with severe viral-bacterial CAP

Parameter	General information content	Diagnostic Wald's coefficient	The relative risk	Odds ratio	p	χ^2
obesity	2,50	8	6,00	12,00	0,012	6,3
disorders of consciousness	1,64	7	5,00	8,33	0,037	4,4
Breathing rate ≥ 35 per minute	0,14	-1	0,73	0,00	0,056	3,7
SaO ₂ <80%	1,43	6	5,50	10,00	0,021	5,3
PaO ₂ <50 mmHg	2,88	7	4,67	12,00	0,036	4,4
PaCO ₂ ≥ 50 mmHg	0,11	-3	0,56	0,00	0,042	4,1

Conclusions: 1. Independent predictors of mortality in patients with severe virus-associated CAP according to the logistic regression are the presence of obesity, disorders of consciousness, SaO₂<80%, PaO₂<50 mmHg, PaCO₂ ≥ 50 mmHg. at hospitalization, the most significant is the presence of obesity and PaO₂<50 mm Hg.

2. Major steps in determining the severity of the patients with virus-associated severe CAP and their treatment are diagnostics of blood gases, and early sufficient and adequate oxygen therapy with regular monitoring of its effectiveness and timely correction.