

Artificial Intelligence Transformer Models for Optimize the Prognosis in Patients with Myocardial Infarction and Lung Cancer

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Abstract

Objective: To create a scale to predict cardiovascular death in patients with myocardial infarction and malignancy. **Materials and methods:** 106 patients with myocardial infarction and cancer were included in the study, 64 men (60.4%) and 42 women (39.6%), mean age 63.8 ± 13.4 years. For the second model The sample size of patients who smoked traditional cigarettes was 167 people, who switched to AIDN - 37 patients. Smoking experience in the group of smoking patients was 17.5 ± 10.7 years, in the group after switching to AIDN - 3.4 ± 2.8 years. Of these, 56 patients had a negative prognosis, which corresponded to the minimum threshold level of statistical significance $p < 0.05$. **Results:** This model visualized that the diagnostic levels of the scale values were: total cholesterol (TC) level 6.26 mmol/l, RDW-CV - 16.3%, neutrophils - 53.1%, eosinophils - 6.3%, leukocytes $-9.1 \times 10^9/l$. F-criterion of the full model was -6.3, coefficient of determination $R^2=4.5$; significance level was $p=0.03$ Predictive Value: The sensitivity of the model was 85.7%, specificity was 87.5%. The area under the ROC-curve was 0.798, which was corresponded to a score of "good" on the area under the curve scale. In next model these were chronic obstructive pulmonary disease (COPD; $r=0.480$ $p=0.006$, chronic kidney disease ($r=0.670$ at $p=0.001$), level of coefficient of variation of erythrocytes (RDW-CV; $r=0.448$ $p=0.004$), leukocyte content ($r=0.33$ at $p=0.016$), increased liver density according to ultrasound scanning ($r=0.543$ $p=0.042$). It was found that patients who smoked traditional cigarettes were more likely to die from MI than those who smoked heated tobacco systems. (12,1% versus 5,6%). It is also important to note that the phenotype of patients smoking heated tobacco systems was closer to that of non-smoking patients, which may result in a milder clinical picture. **Conclusion:** The model haematological parameters used in routine practice: RDW-CV, leucocyte count, segmented neutrophils, eosinophils, TC, as well as increased hepatic density according to ultrasound scanning and the presence of chronic obstructive lung disease. All parameters are maximally reproducible in clinical practice not only for inpatients, but also for outpatients. The second study showed that

smoking is an important factor affecting the clinical course of myocardial infarction. Patients smoking traditional cigarettes have a higher risk of death from myocardial infarction, whereas smoking heated tobacco systems is associated with a less severe clinical course of myocardial infarction, and the phenotype of these patients is closer to that of nonsmoking patients.

Keywords

Myocardial Infarction, Lung Cancer, AI Model