Acute coronary syndromes (ACS) are terms used to depict a range of conditions related with sudden, partial or complete blockage of blood flow in the coronary arteries. ACS can be divided into three groups: ST-segment elevation myocardial infarction (STEMI) which corresponds to heart attack, non-ST-segment elevation myocardial infarction (NSTEMI) and unstable angina (UA), all with common pathophysiology associated with coronary artery thrombosis. The most critical risk factor in the cardiovascular system disturbance, is pathological, augmented activation of blood platelets. Due to a large number of specific membrane receptors, blood platelets are highly reactive cells, readily activated by many physiological and unphysiological agonists. For this reason, platelet surface receptors represent important targets in pharmacological therapies in ACS, especially P2Y12 (ADP-receptor blocked in dual antiplatelet therapy). Thus, we performed comparative analysis of the amount of mRNA transcripts and the concentration of P2Y12 receptor in blood platelets between patients diagnosed with ACS and healthy control group. The mRNA level of P2Y12 was measured using quantitative Real-Time PCR method. RNA samples isolated from blood platelets were reverse transcribed to cDNA, and the relative (according to 18S rRNA) expression of P2Y12 was measured. Estimated mRNA level was significantly higher in patients with ACS in comparison to healthy controls (p< 0.0001). Furthermore, the concentration of P2Y12 in blood platelets, performed by ELISA technique, was also significantly increased in study group (p< 0.001). Additionally, we separately analyzed obtained results between STEMI and NSTEMI patients, but no differences were observed. To conclude, platelets from ACS patients showed an augmented amount of mRNA transcripts for P2Y12 receptor and higher concentration of this protein, suggesting the potential explanation of hyperactivity of platelets in ACS patients.