1. **Background**

Non-ST segment elevation myocardial infarction (NSTEMI) is a type of Acute coronary syndrome )ACS(, in which there is severe coronary obstruction, but not total occlusion of a coronary artery. The disease is characterized by episodes of plaque rupture in the coronary arteries result in a release of biochemical markers of necrosis, but without extensive patterns of cardiac muscle necrosis. Therefore there are no ST elevations present in an ECG. Typical presentation consists of anginal pain (or angina equivalent) during rest, that is a severe, frank pain of new onset and occurs in a crescendo pattern. ECG changes that are not ST elevations may be present, as well as elevated biomarkers, such as CK-MB, Troponin T and Troponin I.(1)

Global registry of acute coronary syndrome (GRACE) score is intendent to evaluate risk factors and management of NSTEMI patients. This tool is specifically designed for risk stratification in patients with acute coronary syndrome (ACS), and is more treatment oriented, compared with other ACS risk scores. The GRACE risk score also predicts death 1-3 years after hospitalization(2). The score refers to variables included age, cardiac arrest, ST-segment deviation, ST-segment elevation on ECG, cardiac enzymes, systolic blood pressure and heart rate at the time of hospitalization, use of a loop diuretic (substituted for Killip Class) and creatinine. The score results are: < 109 – low risk (1% mortality), between 109 to 140 – intermediate risk (1-3% mortality), > 140 – high risk (above 3% mortality) (3).

The ESC (European Society of Cardiology) 2015 guidelines on the management of NSTEMI, divide timing of interventional therapy while considering clinical presentation, ECG results and the hemodynamic and ischemic status as follows: Immediate invasive strategy < 2h, early invasive strategy < 24h, late invasive strategy < 72h. An immediate invasive strategy is indicated in patient with at least one very high risk NSTEMI criteria, such as hemodynamic instability, life-threatening arrythmia or cardiac arrest, complications of MI, persistent chest pain after medical therapy, acute heart failure of ST-T segment changes in ECG. The treatment that required in such cases is an immediately angiography and percutaneous coronary intervention. atients with high risk such as elevated cardiac enzyme level, ST segment changes or GRACE > 140 should be treated in an early invasive strategy. Patients with one of the following: diabetes mellitus, renal insufficiency (EGFR < 60), evidence of congestive heart failure, early post-infract angina, recent PCI, prior CABG, 109<GRACE<140, should be treated in a late invasive strategy. In patients with none of the above and no recurrent symptoms the recommendation is non-invasive testing (such as imaging) before choosing the invasive strategy(4).

A study conducted by Arora et. al performed real-world analysis of NSTEMI patients undergoing coronary revascularization between 1987 to 2012. The study found improved survival in high risk patients undergoing early PCI, vs. high risk patients who underwent late PCI at 1 year follow-up. In addition, 28 mortality was found to be higher in patients who underwent late PCI, probably due to prolonged ischemic time prior to revascularization. (5)

From study made in Detroit, that compare between Streptokinase treatment to Placebo treatment in patients with acute ischemic symptoms, there are evidence that streptokinase was effective in achieving reperfusion, but there wasn’t much change in improvement of left ventricular function(6).
In contrary, studies showed that invasive treatment decreased hospital mortality and 12-month mortality in women (from 30% to 22%) and men (from 32% to 22%), but in every decade the results get worsened(7) . But, according to patients with thrombolysis myocardial infraction (TIMI) grade 2/3 in NSTEMI, before treating PCI – there was no change in survival and 30-days-mortality and 12-months-mortality(8, 9) .

studies showed that in reality, NSTEMI patients falls into two categories – part of them will get an immediately intervention if they are unstable, and the other will wait around 62h regardless categorization of risk(4). A study conducted in Rabin health center between 2000-2013 compare between a group of early intervention (until 24h) and late intervention (above 24h) – the study show that delayed angiography was dependently associated with increased 5-year mortality(10).

A study published at the AHA (American Heart Association) annual conference in 2019, called the International Study of Comparative Health Effectiveness With Medical and Invasive approach (ISCHEMIA), compared treatment options for patients with stable ischemic heart disease (SIHD) and moderate-severe ischemic disease. Patients were treated conservatively vs invasive strategy (PCI or CABG). The results showed no significant benefit for interventional therapy on mortality rate after 4 years, rate of hospitalization and another complications. For CKD patients or patients without angina the conclusions are the same. Finally, it was found that the probability of at least a 10 percent benefit of the invasive group on all-cause mortality was <10 percent (11, 12).

while previous studies investigated the result of PCI intervention in NSTEMI patients compared to patients who got an invasive treatment until 3 days, or patients got only got conservative treatment , without taking the time factor into account, our study aims to determine a critical cut-off, after which a PCI intervention will not be efficient. Our study aims to understand the result of PCI treatment 3 days after the NSTEMI event, compare to PCI treatment that was given later than 3 days from the NSTEMI event, considering mortality and myocardial injury (ejection fraction).