Relation of the Systemic Blood Pressure to the Collateral Pressure Distal to an Infarct-Related Coronary Artery Occlusion During Acute Myocardial Infarction

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Collaterals to occluded coronary arteries have been observed early after onset of acute myocardial infarction (AMI). The pressure distal to the occluded segment of the culprit coronary artery (P_d) is generated by collateral flow from the feeding coronary artery supplied by the systemic circulation. The aim of the study was to assess the relation between systemic blood pressure (BP) and P_d. Systemic BP and P_d were measured simultaneously during intervention of totally occluded coronary arteries in 152 patients admitted for AMI. Patients were divided into groups by time from symptom onset to P_d measurement. There was a significant positive correlation between P_d and the systolic, diastolic and mean BP measured during the first 3 hours from symptom onset (n=60, p0.05, p0.006, p0.005, respectively), between 3-12 hours (n=56, p0.02 for all), and after 12 hours from symptom onset (n=36, p0.003 for all). The collateral flow, represented by calculated collateral flow index (CFI, 0.37±0.14, median-0.36) correlated with mean BP (p=0.05) but not with diastolic or systolic BP (p=NS) in the overall study population. A direct relation was established during AMI between systemic BP and P_d at all time intervals from symptom onset. CFI correlated with mean BP and was strongly associated with P_d at all time intervals. This relation suggests caution when administering therapy that may lower systemic BP during AMI prior to restoring flow in the occluded culprit artery, as it may compromise collateral pressure and exacerbate myocardial ischemia.