Review

Large and micro coronary vascular involvement in diabetes

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Abstract:
Diabetes, with hyperglycemia as its hallmark, is a major risk factor for ischemic heart disease. The role of coronary disease in the adverse prognosis of diabetes is controversial although the higher prevalence and extension of coronary atherosclerosis is well recognized. The paper reviews the available evidence of coronary involvement in diabetes with particular emphases on microcirculation.

Several studies, mainly in type 2 diabetes, have documented a reduced coronary flow reserve even in absence of coronary obstructive disease and using different techniques. Microcirculatory dysfunction affects the left ventricle globally as well as regionally. However, neither the prevalence of such abnormality in the diabetic population nor its time course and its prognostic value have been investigated in specifically addressed studies. In fact, a relatively large number of studies on myocardial perfusion performed by single-photon myocardial scintigraphy in asymptomatic diabetics rather address the problem of the prevalence of silent ischemia and its prognostic value. In spite of such limitation it can be speculated from the few available studies with known coronary anatomy that the prevalence of exclusively regional disturbances of perfusion (scintigraphic defects) in absence of obstructive coronary disease is not marginal as it ranges from 11 to 63%. Extensive research is still required to define the pathogenesis and the actual clinical relevance of coronary microcirculatory dysfunction in diabetes.

Key words:
coronary artery disease in diabetics, coronary microvascular dysfunction, myocardial perfusion scintigraphy, coronary endothelial dysfunction

Abbreviations: ACE – angiotensin-converting enzyme, MI – myocardial infarction, MPS – myocardial perfusion scintigraphy, PET – positron emission tomography

Introduction

Up to 80% of diabetic patients die from cardiovascular diseases [27]. The relative risk of cardiac mortality in diabetics, as compared to non diabetics, is from 5 to 3 times higher depending on the number of other clustered risk factors (Fig. 1) [39], while both the early and late case fatality rate of acute myocardial infarction (MI) are twice as higher [2, 3, 10, 20, 47]. Thus diabetes, with hyperglycemia as its hallmark, appears to be a major risk factor for ischemic heart disease and for the adverse outcome following MI. However, the multifactorial nature of the disease and its stereotyped definition, based on the arbitrary dysaggregation of factors and the conventional attribution of cut-off values to biological variables makes results of studies less clear-cut when different components of the disease are taken into consideration. As an example, the epidemiological findings reported above have