Cardio DIGEST
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Editorial

Diastolic dysfunction in diabetes

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'The practicing clinician does need to be aware of the signs/symptoms, prevalence of and potential treatment mortalities for diastolic heart failure in diabetes.'

It is, of course, well-recognised that the incidence of heart failure (HF) in men and women with diabetes is two-to-four times higher than those without diabetes. In a more recent study, diabetes was identified as a major risk factor for the development of HF. Conversely, in patients with diastolic HF, 30 % of patients also have diabetes. Whilst left ventricular diastolic dysfunction may be the first stage of cardiomyopathy, a number of studies have documented a high prevalence of diastolic dysfunction in young, normotensive patients with type II diabetes who demonstrated excellent diabetes control. This abnormality of diastolic dysfunction in diabetes has been recorded to be independent of age, blood pressure, left ventricular mass and also left ventricular systolic function. Any abnormalities increase considerably in the presence of hypertension, demonstrating an additive deleterious effect. Further ventricular relaxation correlates with glycaemic control as judged by HbA_{1c} levels. Indeed, it has been proposed that 1 % increase in HbA_{1c} results in an 8–10 % increase in the risk of HF. In addition to age, blood pressure, left ventricular mass and left ventricular systolic function, microalbuminuria appears to be an independent risk factor for the development of diastolic dysfunction.

However, further studies will be required to identify the precise association between routine testing for microalbuminuria as a screening method for those in whom identification of left ventricular diastolic dysfunction is required.

Clinical manifestations of diastolic dysfunction are predominantly related to limitation of exercise tolerance. However, additional features of HF, such as fatigue and exertional resting dyspnoea, may be found. Diastolic HF is diagnosed in the presence of signs and symptoms of HF, together with normal left ventricular systolic function and evidence of abnormal left ventricular relaxation, filling or diastolic stiffness. The diagnosis of diastolic dysfunction is important as mortality rates appear to be similar for diastolic HF and systolic HF. The mortality for diastolic HF is greater in the presence of ischaemic changes.

What then are the implications of such data for the practicing clinician? There are clearly implications on the already strained cardiorespiratory facilities within secondary care, and increasingly primary care with the development of intermediate services. The necessity for appropriate investigation, such as echocardiography, would lengthen the already difficult waiting times in most departments.

What about treatment once diastolic HF has been noted in patients with diabetes? The management is based on small studies, clinical experience and intuition that reducing the otherwise deleterious process known to exert important effects on ventricular function would result in an improvement in patients' signs and symptoms. Further data have become available from the Digitalis Investigation Group and the Candesartan in Heart Failure: Assessment of Reduction in Mortality and Morbidity (CHARM)–preserved left ventricular function trials. Treatment is based on maintaining left ventricular function, particularly with synchronous atrial contraction, by maintaining/restoring sinus rhythm. Reduction in left ventricular diastolic volume results in improved symptomatology. This can be achieved by reducing total volume with sodium and water restriction, and diuretics. Decreasing central blood volume through pre-load reduction with nitrates may also be helpful as might the use of angiotensin converting enzyme inhibitors and angiotensin II receptor antagonists. Late left ventricular function and filling is dependent on atrial contraction and, therefore, treatment of tachycardias would assist by causing complete filling. Consequently the use of ß-blockade or calcium-channel blockers may prevent increasing left ventricular pressures by maintaining heart rate.

Whilst more extensive studies are currently ongoing, the practising clinician does need to be aware of the signs/symptoms, prevalence of and potential treatment mortalities for diastolic HF in diabetes, which appears to be a common occurrence.

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