

# HEART FAILURE IN THE AGED

BY

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Heart failure in old age differs in many ways from that in earlier life. Aetiology, pathology, course, symptoms, and treatment are all modified by the special circumstances. For example, rheumatic disease and syphilitic disease are not common over the age of sixty; but toxæmia, especially after pneumonia, becomes an important factor. Before middle age, the pathological state of the heart itself is all important: after this, the condition of the peripheral vessels also must be taken into account. In the young, recovery is more rapid and lasting: in the old, relapses are the rule and not the exception. Congestive failure with "back pressure" is the chief form of failure in early life: but ischæmic failure, as angina pectoris and coronary thrombosis, becomes more frequent as old age approaches. The present paper is an analysis of the history of cardiac failure in seventy-five old or elderly persons, and attempts to point out the special characteristics arising in senility. Owing to lack of post-mortem facilities in war time, only the clinical features are available for consideration.

## AETIOLOGY

The series was composed of 75 patients whose ages ranged from sixty-two to ninety-two. All were males and all but five were Chelsea pensioners. No congenital or rheumatic heart disease was found, and the youngest patient was the only one with syphilitic heart disease. The commonest cause of cardiac failure was a high blood pressure, which was the sole factor, apart from arteriosclerosis, in 27 cases. Coronary arterial disease alone accounted for 13, while coronary disease and hypertension were found together in 4 cases. A toxic myocardium, resulting from pneumonia or some other infection, was the cause of failure in 11 cases, 2 of them having had hypertension previously and 2 others having had previous coronary thrombosis. The remainder were originally classed as "myocardial degeneration," but more careful study of their records enabled them to be analyzed more precisely. Six of these were probably due to past high blood pressure. Each had the heart enlarged to the left, and was admitted to hospital with a blood pressure that continued to fall until death. Two more followed long standing asthma and chronic bronchitis, so were classified as chronic cor pulmonale. One was a heart block of unknown cause. One showed increasing peripheral ischæmia with a blood pressure that fell steadily until death. All the rest showed congestive heart failure, complained of dyspnœa on exertion, had no raised blood pressure, and never had pain in the chest or arm on effort; this, of course, may have been because they never exerted themselves enough. These results are summarized in Table I.

TABLE I  
AETIOLOGY OF HEART FAILURE IN THE OLD

Hypertension alone (including 6 where the diagnosis was "probable past hypertension") ..	33
Coronary disease (alone 13, and with hypertension 4) .. .. .	17
Myocardial toxæmia .. .. .	11
Various (chronic cor pulmonale 2, heart block (? cause) 1, syphilitic heart disease 1, and uncertain, 10) .. .. .	14
	75

## VARIETIES OF FAILURE

While congestive failure, anginal failure, and coronary thrombosis are among the commoner forms of cardiac defeat, other varieties peculiar to senility also occur. These seem to result from the inability of the left ventricle to propel the blood against the increased resistance of the thickened and narrowed peripheral arteries. The basic pathology shows itself as peripheral ischæmia, sometimes intermittent, sometimes constant, and sometimes progressive. Steiglitz (1935), in his book *Abnormal Arterial Tension*, refers to this conception as relative hypotension. The dominant symptoms are usually cerebral in origin. One symptom-complex of this type has already been described by the present writer (1941 and 1943) under the name of progressive cerebral ischæmia. Here, an arteriosclerotic patient with high blood pressure shows first mental confusion, then restlessness or violence, and finally becomes comatose while his systolic figure falls from its previous high grade to the ultimate level (around 100 mm.) at which death ensues in such cases. This syndrome may follow right or left heart failure which has been treated with apparent success, or may result from myocardial toxæmia after an infection, such as pneumonia. This latter occurrence was mentioned by a former physician to the Royal Hospital in 1863.

One other form of "forward" failure requires notice. This is the gradual but steadily increasing feebleness, accompanied by a slowly falling blood pressure, seen in a few patients. There is no angina pectoris, no congestive failure, no paroxysmal dyspnœa, nor are cerebral symptoms prominent. As the great Harvey says in Chapter 3 of *De Motu Cordis et Sanguinis*—"When this (left) ventricle contracts languidly, the pulse in the arteries is scarcely perceptible."

The varieties of heart failure are summarized in Table II.

TABLE II

VARIETIES OF FAILURE IN THE OLD				
Left heart failure (paroxysmal dyspnœa)	..	..	..	16
Right heart failure (congestive)	..	..	..	13
Right and left heart failure together	..	..	..	9
Coronary thrombosis	..	..	..	10
Angina pectoris	..	..	..	4
Coronary ischæmia and right heart failure	..	..	..	3
Cardiac stoppage	..	..	..	3
Progressive cerebral ischæmia alone	..	..	..	12
Other forward failure	..	..	..	5
				75

Other cases, provisionally labelled as relative hypotension, have been excluded from the present series. This was on account of the difficulty in separating them clearly from what might be termed arteriosclerotic dementia. Such patients often die a non-cardiac death, e.g. from hypostatic pneumonia or enteritis. In practice, hypostatic pneumonia must be distinguished from pulmonary œdema of cardiac origin. The latter benefits from the administration of mersalyl as a rule: the former often seems to be made worse by it.

## DISCUSSION

The first point which appears from the consideration of the above facts and figures is the frequency of multiple ætiology, when compared with causes of heart failure in young persons. Arterial thickening probably played a part in most of the cases, usually in association with hypertension or disease of the coronary artery. Sometimes myocardial toxæmia was super-added on top of these causes, and this made a fatal prognosis almost inevitable. Secondly, no less than 13 per cent of the cases had heart failure of which the cause was uncertain, even after repeated clinical examination. Although the term "myocardial degeneration" is deservedly disliked by cardiologists, some label must be applied to those cases of congestive failure whose cause cannot be determined during life with any degree of certainty. Arterio

sclerosis can be considered as playing a part both as external resistance to the output of the left ventricle and also by lessening the nutrition of the myocardium. Yet cases are often met, with thickened and tortuous arteries, who do not complain of any discomfort in chest or arm on normal exertion. This absence of symptoms of angina pectoris has been remarked by previous medical officers at the Royal Hospital (Lipscombe, 1932). Out of the four patients in the series, one was a private case and one followed coronary thrombosis; while the time taken to collect the total of seventy-five was over four years.

As noted above, high blood pressure is the commonest cause of heart failure in the series. This is as one would expect, since between forty and fifty per cent of Chelsea pensioners show a systolic pressure above 160 mm. Such cases die in congestive failure (52 per cent), from myocardial toxæmia (11 per cent), with progressive cerebral ischæmia (33 per cent), or with a gradually falling blood pressure (4 per cent). In the patients with congestive failure, the right ventricle was affected as often as the left, which suggested that the hypertension was not the only factor to be considered.

The final impression remaining was that the level of the blood pressure and the state of the arteries were the two deciding factors in prognosis. Once the former was unable to overcome the resistance of the latter, ischæmia of vital organs was present. Clinically, this usually showed itself by increased restlessness and a desire to get in and out of bed repeatedly without reason. When this occurred, a fatal termination was not far off.

#### SUMMARY

The causes and forms of heart failure in 75 old persons are described.

The commonest causes of failure were high blood pressure, disease of the coronary artery, and myocardial toxæmia.

In 13 per cent of the cases, the cause of heart failure remained uncertain after repeated clinical examination.

The occurrence of "forward" heart failure, with peripheral ischæmia is described; and the importance of arteriosclerosis in producing circulatory failure is stressed.

#### REFERENCES

- Harvey, W. (1628). *De Motu Cordis et Sanguinis*.  
 Howell, T. H. (1941). *Postgrad. med. J.*, 17, 195.  
 Howell, T. H. (1943). *Brit. med. J.* (in press).  
 Lipscombe, F. M. (1932). *Diseases of Old Age*, London.  
 Maclachlan, D. (1863). *A Practical Treatise on the Diseases and Infirmities of Advanced Life*, London.  
 Steiglitz, E. J. (1935). *Abnormal Arterial Tension*, New York.