

Sir James Mackenzie and the history of myocardial infarction

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SUMMARY. Sir James Mackenzie's writings support the widely agreed history of the appearance and rise of myocardial infarction in Britain during this century. His case histories confirm that sudden serious infarctions, so common today, were rare at the beginning of the century.

Introduction

IN his biography of Sir James Mackenzie, Professor Alex Mair assessed Mackenzie's contribution to cardiology as follows:

"His work on irregular action of the heart, the action of digitalis and the studies of auricular fibrillation were fundamental contributions to the clinical understanding of heart disease at that time, conspicuous only by the failure of him and others of his era to recognise the significance, *even the presence* of that condition so prevalent today, coronary thrombosis or myocardial infarction . . ." (Mair, 1973) [my italics].

My belief that the reason for this failure was simply the fact that in Mackenzie's day myocardial infarction, as we know it now, did not occur (Yellowlees, 1979) has been challenged by Professor J. McCormick, firstly in his letter to this journal of April 1979 (McCormick, 1979) and more recently in a longer article (McCormick, 1981).

Our understanding of the cause of certain diseases can often be enhanced by a knowledge of their epidemiology. The history of coronary thrombosis is therefore of immense importance, and I wish to give my reasons for suggesting that Professor McCormick's article gives no evidence to support his claim that "myocardial infarction was common in the 1890s and early 1900s".

Angina pectoris

To a reader unfamiliar with Mackenzie's writings, Professor McCormick's comments on Mackenzie's use of 'angina pectoris' as a diagnosis are misleading. He

writes as if to make us believe that Mackenzie used this diagnostic label exclusively for pain due to ischaemia and that the 384 cases mentioned by Mackenzie in his book *Angina Pectoris* (Mackenzie, 1923) were all suffering from coronary disease.

It is, however, obvious from Mackenzie's use of words that to him 'angina pectoris' was pain in the chest and that it was a term which covered a multitude of diseases. Mackenzie tells us that for a "considerable number" of his 384 cases he knew the date of death only because he saw the announcement in the papers. He wrote:

"A number have died from unknown causes as in those cases where I have seen the death in the newspapers or got information from some source that the patient was dead. As I have already said a number have died from diseases which one could not attribute to the heart, but I have records of 284 who died of heart failure or from conditions such as apoplexy which were due to the same disease that caused the angina pectoris" (Mackenzie, 1923).

So we do not know how many of the 384 cases were suffering from valvular disease, syphilis, cancer or neuroses. And how many of those 284 who died of heart failure were suffering from ischaemia due to atheroma? As far as I know, Mackenzie did not give detailed case-notes of all the 284, but in *Angina Pectoris* he does provide the history of 160 angina patients.

Mackenzie's cases

In many of those cases—especially those in which arrhythmia and dyspnoea were prominent features rather than pain—it is impossible to give a true diagnosis. However, from a study of the histories I have made the analysis shown in Table 1. The miscellaneous cases include nine of cancer, five obviously psychosomatic, one case of rheumatoid arthritis and two of pelvic disease in women.

Mackenzie used the same case histories taken from *Angina Pectoris* in his larger textbook *Diseases of the Heart* (Mackenzie 1913), to which Professor McCormick refers.

The difficulty of making a diagnosis from such a

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Table 1. Analysis of the 160 cases detailed in *Angina Pectoris*.

Coronary artery disease	65
Valvular disease	29
Syphilis	7
Hypertension	7
Miscellaneous	21
Don't know	31
Total	160

distance is well illustrated by the first post-mortem reproduced by Professor McCormick in his article. The extract given by him omits the important sentence: "The intra-auricular septum was so stretched that the foramen ovale had been re-opened." In this post-mortem report there is no mention of coronary atheroma. There were multiple infarcts in kidneys and lungs and gross dilatation and hypertrophy of the heart. As Professor McCormick remarks, it is hardly a typical case of myocardial infarction.

Case 35 reproduced by Professor McCormick is the same as Case 21 in *Angina Pectoris*. Our opinion of the post-mortem findings cannot really be complete unless we know something of the history which Professor McCormick has omitted. For instance:

"At age 37 he had an attack of 'inflammation of the kidneys . . .'. Blood pressure 210 mm/Hg; the urine contained a large quantity of albumin. . . . His pulse was usually alternating in rhythm and this peculiarity was more marked when the pressure was high. When the pulsus alternans had disappeared with lowered blood pressure it could easily be brought back by running up a flight of stairs. . . ."

All this was before the patient experienced chest pain. Again, hardly a typical case of myocardial infarction.

The following two cases are quoted in detail from Mackenzie's list of 160. They should be read as a comment on Professor McCormick's statement "Mackenzie used this term [angina pectoris] to describe the characteristic pain of myocardial ischaemia." This statement is, of course, partly true but, as the cases show, it is not the whole truth.

Case 155—female aged 51

"Complains of pain across the chest and into the left arm. She is in bed and the attacks come with no evident provocation. They are very frequent 15/20 in the 24 hours and so severe that her medical attendant thought she was dangerously ill of a grave form of angina pectoris. The pain is felt across the chest and down the inner side of the left arm. There is also a feeling of constriction in the chest. . . . In searching for a provoking cause the only sign was an indefinite swelling behind the uterus. The attacks described above continued with no improvement for three weeks when there was a profuse discharge of pus from the bladder—evidently an abscess had burst into the bladder. The attacks of angina immediately stopped. She made a good recovery."

Case 113—male aged 14

"Complains of great weakness and attacks of severe pain in the left chest and arm. His illness began seven years previously after an attack of rheumatic fever which affected his heart. He had another attack of rheumatic fever two years ago. Since that time he had been very frail. . . ."

"The apex beat is diffuse, as low as the seventh interspace and out to the mid axillary line. . . . At the apex there is a long loud systolic murmur. No second sound to be heard here. At the base the same systolic murmur is heard with a soft second sound. On testing the skin for the presence of cutaneous hyperalgesia . . . the light pressure on the skin under the left nipple caused an attack of pain of great severity, during which he leant forward, crossed his arm across his chest and nursed the left upper arm. He sobbed and cried and writhed in agony, his face became pale, beads of perspiration broke out on his forehead. . . . When he had quietened he said the pain had started at the place I pressed, spread up the chest and lodged in the upper arm where it stayed and became agonising. . . . The patient died three months later."

In the analysis in Table I, the 67 cases which in my opinion could confidently be diagnosed as suffering from coronary disease showed features typical of angina of effort. In some patients symptoms continued for many years. It is highly significant that there is not one single case of sudden massive infarction followed swiftly by death in a previously symptom-free subject.

The history of infarction

The absence of acute infarction and the above breakdown of cases diagnosed as angina pectoris is what one would expect from the widely agreed history of coronary heart disease outlined by Michaels (1966).

Angina of ischaemia was first described by Heberden in the eighteenth century. The relationship of coronary artery narrowing and coronary atheroma (sometimes with calcification) to angina was well understood by the physicians of the nineteenth century and by Mackenzie. But sudden serious infarction with pallor, shock, collapse and often death, occurring in a patient who has had no previous history of cardiac illness, was not described in Britain until the 1920s, nor did infarctions reach epidemic proportions until after the Second World War. This type of infarction was an entirely new manifestation of cardiovascular disease and we still do not know if it was caused by new changes in the vessel wall or in the blood (Meade and Chakrabarti, 1972).

Hospital records

Hospital records confirm the rarity at the beginning of this century of sudden crippling infarction. Sir William Osler (1910) gave the figures shown in Table 2 for two London hospitals. In Edinburgh in 1907, the same year as the London figures, out of 4,149 admissions to the Royal Infirmary only nine cases under 60 years of age were labelled 'arteriosclerotic heart disease' (Edinburgh Hospital Records, 1907).

Table 2. Angina pectoris in two London hospitals (1907).

Hospital	Total admissions in 1907	Number of cases of angina pectoris
St Bartholomew's	2,602	2
St Thomas	2,261	2

Source: Osler (1910).

In 1939, 1940 and 1941 I worked as a student in Edinburgh teaching hospitals, and for a while in 1940 I worked and lived in one of the dispensaries which served the teeming slums of Edinburgh's Cowgate and Canon-gate. I can assure Professor McCormick that my memory does not play me false when I state that neither in the hospitals nor in the slums in those years was myocardial infarction a common occurrence. Moreover, Dr Rae Gilchrist (personal communication, 1971), for many years Edinburgh's leading cardiologist, has recorded the experience of myocardial infarction in Edinburgh Royal Infirmary. His record is summarized in Table 3.

Sir Ian Hill (1980) tells how in 1928, as a house physician, he encountered his first case of coronary thrombosis:

"Something of which neither my chief nor I had ever heard. . . . Nowadays every young medical student sees dozens of cases during his undergraduate years. . . . *The dramatic increase is real* and not due to better recognition."

In a recent history of cardiology in Edinburgh Royal Infirmary Marquis (1979) describes the arrival of myocardial infarction as follows:

"... it would be mistaken to imagine that the subsequently increased recognition of myocardial infarction has been due primarily to greater awareness and more astute diagnosis. Gilchrist had subscribed to the *American Heart Journal* since its inception and had been on the lookout during the years since Christian's clear account (1925). The first opportunity came to make the diagnosis on clinical grounds in the Royal Infirmary in 1928. That was the first in Scotland: Christian had no cases in his ward to demonstrate when Gilchrist visited Boston in 1927 and it took two years to accumulate twelve cases in Edinburgh. Fifty years later the diagnosis of myocardial infarction is confirmed in over 500 patients admitted to the Coronary Care Unit of the Royal Infirmary each year."

Present-day incidence

All of us in general practice can confirm the appalling frequency of myocardial infarction today. In a two-month period last winter in this practice we had four cases, all men in their 50s, none of whom had any previous history of heart disease. Only one survived; the others died within two or three days of the onset of pain.

Table 3. Cardiac infarction seen by Gilchrist in Edinburgh Royal Infirmary, 1924-54.

Year	Number of cases	Period (years)
1924-26	0	2
1928-30	12	2
1946-49	100	7
1947-54	321	7

"In an average general practice there are 500 male patients between 34 and 64, about 100 are likely to have coronary attacks before retiring age. Of these, 25 will die suddenly before medical aid can be called, a further 15 will not survive the initial episode" (Ball, 1978).

Professor McCormick's explanation of the absence in the hospital records of Mackenzie's day of any hint of this catastrophic incidence of myocardial infarction is, in my opinion, quite divorced from reality. He states that "hospital experience of the disease does not necessarily reflect its incidence or prevalence in the community". In the case of coronary thrombosis this statement, in my opinion, is incorrect. If cases were occurring in the 20s, 30s and 40s on the same scale as now and were not flooding into the hospitals as they do today, we are bound to conclude that in those decades, in the suburbs and in the tenements of our great cities, hundreds of men were lying at home having their infarctions, tended only by their families, and that their general practitioners were under some strange vow forbidding them to write or speak of what they were witnessing!

If myocardial infarction was as common in Mackenzie's time as it is today and if, as Professor McCormick states, it frequently led in those days to sudden death, how could Mackenzie, after a lifetime of experience as a general practitioner and as a cardiologist, write:

"Angina pectoris is but the expression of exhaustion and is not therefore necessarily a serious condition in the usual meaning of that term—i.e. that death is impending. The changes which it indicates, irremedial changes which impair the heart's efficiency, and which are slowly progressive, are after all only those changes which may be expected to occur with advancing years. There are cases in which angina pectoris develops with great severity and ends speedily in death. *On the whole these cases are rare*" (Mackenzie, 1916) [my italics].

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Diagnostic Quiz

The answers to the December quiz are as follows:

1. What is the procedure?

Selective renal arteriography

2. What abnormality is present?

Large adrenal tumour

3. What is the likely nature of this lesion?

Phaeochromocytoma

Conn's adenoma (aldosteronism)

Cushing syndrome

The winner of a £100 British Airways travel voucher is Dr A. Demetriou of Salford, Greater Manchester.

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Heart attacks and the Pill

In a hospital-based case-control study, the authors evaluated the rate of myocardial infarction in relation to discontinued as well as current use of oral contraceptives. For current users, the rate-ratio estimate was 3.5 and for past users 40 to 49 years of age, the magnitude of the rate ratio was related to the duration of use. The findings suggest that an effect on the risk of myocardial infarction persists after the discontinuation of long-term use of oral contraceptives.

Source: Sloane, D., Shapiro, S., Kaufman, D.W. *et al.* (1981). Risk of myocardial infarction in relation to current and discontinued use of oral contraceptives. *New England Journal of Medicine*, 305, 420.

Alcoholism and hypertension

Blood pressures of 132 alcoholic patients whose mean daily alcohol consumption exceeded 80 g were measured while drinking, during detoxification from alcohol and after a period of abstinence. At the time of presentation blood pressure exceeded 140/90 in 51.5 per cent of patients. There was a significant correlation between blood pressure and mean daily alcohol intake over the previous three months, and also between the level of blood pressure and the severity of alcohol-withdrawal symptoms. In most patients blood pressure fell to normal after detoxification, and remained so for at least a year in those who continued to abstain. However, blood pressure rose in those who started drinking again.

Source: Saunders, J. B., Beevers, D. G. & Paton, A. (1981). Alcohol-induced hypertension. *Lancet*, 2, 653-656.