

ACUTE CORONARY DEATHS

Possible salvage?

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THE Registrar General reports that in 1964 almost 115,000 persons in England and Wales died from coronary heart disease and that in men between 45 and 54 years of age it accounted for one-third of all deaths.

The challenge of this serious modern epidemic has been met, so far relatively unsuccessfully, by attempts to define by epidemiological studies possible causes and applying these findings to preventive actions. Therapeutic measures have been based on the use of drugs such as anticoagulants, whose value is being increasingly questioned, and possible surgical measures which are still at an experimental stage.

More recently with advances in anaesthesia and in techniques of resuscitation more attention has been paid to the possibilities of saving lives during the acute phase of the coronary attack. Reports from hospitals with well-organized intensive-care units have demonstrated that a fair measure of success may be achieved. Goble and his colleagues (1966) at the Royal Melbourne Hospital had a successful 'salvage rate' of 13.2 per cent.

Undoubtedly lives can be saved by a well-organized service designed to deal with the acute cardiac emergency, but for it to have its full impact it must be designed to help all those suddenly struck down, outside as well as inside the hospital.

If we are to apply the benefits of modern resuscitative techniques to all those who require them we must be able to plan a service on knowledge of possible numbers involved. Morris (1964) has pointed out the difficulties of assessing the true incidence of coronary heart disease since the data have to be collected piecemeal from a

variety of sources. We believe that the nearest approach to an overall assessment of the incidence of coronary heart disease and of the appreciation of the problems of management lies in general practice, where the whole spectrum of severity is seen from the almost insignificant clinical symptom to the catastrophic sudden and instant death.

As a contribution to the planning of possible emergency cardiac units we have examined the deaths from coronary heart disease in our practice over the past 17 years and have estimated the proportions in whom intensive care may have been life-saving.

Material and methods

In this south-east London middle-class practice records of all patients who died from coronary heart disease have been kept since 1949. The 17-year period 1949–1966 has been reviewed. During this time the average population at risk was 5,500.

The *diagnosis* of coronary artery occlusion in those who died was made either at autopsy or by positive electrocardiographic changes prior to death.

The review was confined to sudden deaths from proven coronary heart disease that occurred within 24 hours of onset of the final attack.

The *time of death* from onset of symptoms was recorded under three groups:

1. 'Instant deaths'—where the victim was found dead or died within five minutes of onset.
2. 'First-hour deaths'—where death occurred between five minutes and one hour of onset.
3. 'First-day deaths'—where death occurred from 1–24 hours from onset.

The *place* of death was recorded as either at home, hospital or elsewhere, as in the street, office, place of entertainment, transport vehicle.

In our assessment of the *possibility of saving life* we excluded those persons whom we knew had other conditions such as severe hypertension, marked cardiac failure, cancer, chronic bronchitis with serious respiratory failure or general frailty.

Results

During the period 1949–1966, coronary heart disease was diagnosed in 350 persons, a rate of 4 per 1,000 per annum. The clinical types and outcome are discussed by Fry (1964, 1966).

Of these, 149 died from the direct effects of their coronary artery occlusions, 97 (65 per cent) within 24 hours of onset of symptoms.

Deaths within the first 24 hours

An analysis of the deaths within the first 24 hours of the final

attack is necessary before we can discuss the group in whom attempts at resuscitation might have been feasible.

The 97 deaths included 77 males and 20 females. One-half (48) were aged between 50 and 69 and 42 (43 per cent) were aged 70 and over. Nearly three-quarters of these deaths in the first 24 hours were at home (71 per cent), 14 (15 per cent) at hospital and 13 (14 per cent) elsewhere. In 48 (50 per cent) the death was instantaneous. In a third (33 per cent) it took place in the first hour and in 17 (17 per cent) it occurred between 1 and 24 hours from onset.

Thus, of all deaths from coronary artery occlusion 65 per cent occurred within the first 24 hours. It is noteworthy that only another five per cent took place within the subsequent six days. It is during the first day of the attack that our efforts at possible resuscitation must be made.

It is also of significance that 71 per cent of these first 24-hour deaths took place in the person's home and any resuscitative service must be planned to meet this fact.

Further it must be noted that a half of all these deaths (within the first 24 hours) were instantaneous or within minutes and presumably beyond any hope of medical aid.

Possible salvage?

It is now necessary to assess the proportions in whom attempts at resuscitation might have been feasible.

Out of the 97 deaths within the first 24 hours of the attack 48 were instantaneous and beyond any medical help. In another 11 attempts at resuscitation would have been quite unrealistic for reasons stated, for instance, known associated diseases or general frailty.

There were therefore 38 (39 per cent) 'possibles' in whom resuscitation might have been feasible. However, since the present rates of success are in the region of 5-10 per cent, it is probable that, at most, only four lives would have been saved.

The *age and sex distribution* of these 'possibles' is shown in the table and it is evident that it is in men between 50 and 69 that most attempts at resuscitation would be feasible. It is shown also that the proportions in whom resuscitation might have been feasible were greater in the younger persons.

The *place of death* of these 38 persons was home in 27, hospital in eight, and elsewhere in three, stressing the fact that in nearly three-quarters (71 per cent) the primary care would have had to have been started in the person's home and continued in an ambulance.

The *time of death* confirms that there would have been little time

in which to act. Nearly two-thirds (63 per cent) of deaths at home occurred within the first hour.

TABLE

AGE AND SEX DISTRIBUTION OF PERSONS DYING FROM CORONARY HEART DISEASE WITHIN FIRST 24 HOURS OF ATTACK IN WHOM RESUSCITATION MIGHT HAVE BEEN SUCCESSFUL

| <i>Age</i> | 30— | 40— | 50— | 60— | 70+ | <i>Total</i> |
|--|-----|-----|-----|-----|-----|--------------|
| Males | 1 | 3 | 13 | 13 | 4 | 34 |
| Females | — | 1 | — | 2 | 1 | 4 |
| Total | 1 | 4 | 13 | 15 | 5 | 38 |
| Percentage of all first 24-hour deaths | 60 | | | | 12 | 39 |

Discussion

Taking our figures as a basis for discussion we found that resuscitative measures would have been feasible in 39 per cent of all acute coronary deaths occurring within 24 hours from onset of symptoms; that most of these persons would be men aged 50–69 (73 per cent were in this age group); that most of these deaths (71 per cent) occurred at home; and that most (63 per cent) of these deaths at home occurred within the first hour.

If these figures are applied to the United Kingdom as a whole it is possible that resuscitation may be feasible in 24,000 out of the 115,000 deaths from coronary heart disease each year and that with a 5–10 per cent success rate perhaps between 1,200 and 2,400 lives may be saved each year.

A report from the World Health Organization (1965) discussing the need for emergency cardiac services, whilst admitting that figures are difficult to obtain, suggests that in a European nation, such as the United Kingdom, of 50 million, the organization of such services would result in saving up to 10,000 lives annually. This is a much larger estimate than ours and presumably is based on a much greater success-rate from resuscitation.

Applying our rates to a local district hospital serving a population of 250,000, we estimate that an emergency cardiac unit could have up to 120 calls for resuscitation of acute coronary attacks in danger of dying.

The question that has to be considered and balanced is whether, in view of the possibility of saving up to 2,400 lives each year, we should set up emergency cardiac services to try to resuscitate

persons likely to die from an acute coronary attack.

Such services would be expensive in terms of manpower as well as money. To be effective they would have to be prepared to move out into the patients' homes and elsewhere in the community and would have to be on a continuous stand-by and ideally able to reach the emergency within minutes and certainly within an hour.

Such services have been in existence in U.S.S.R. for many years (Moiseev 1962). In Moscow emergency cardiac services are organized in zones of one million persons. Each zone has a hospital-based unit with its own special ambulance. Each ambulance is staffed by doctors and nursing assistants and equipped with an electrocardiograph, a small laboratory for WBC, ESR, and prothrombin time, with oxygen and with equipment for artificial respiration and defibrillation. In Belfast a trial is being carried out with such an ambulance. (*Lancet*, 1966).

Summary

Advances in techniques of resuscitation require us to consider the possibilities of establishing emergency cardiac units for saving lives of victims in acute coronary attack.

To assess the likely numbers that might be involved all deaths from acute coronary heart disease in the first 24 hours of the terminal attacks were analysed in a general practice during a period of 17 years (1949-1966).

During the period under review 97 deaths from acute coronary heart disease occurred during the first 24 hours of the attack. This represented a rate of 65 per cent of all coronary deaths (from a cardiac cause). In 48 of these (50 per cent) death was instantaneous.

It was estimated that attempts at resuscitation would have been feasible in 38 (39 per cent) of these first 24-hour deaths. Amongst these in whom there was a chance of saving life 73 per cent were aged 50-69, 71 per cent died in their homes and 63 per cent of these died within the first hour.

To have any real purpose any service aimed at resuscitating these persons must be prepared to work outside the hospital, in the patients' homes, in the street and elsewhere.

Applied to the United Kingdom it is considered that attempts would be feasible to resuscitate 24,000 of those dying from coronary heart disease annually, with success in up to 2,400 persons.

The possibilities of saving so many lives each year should serve as a challenge to set up experimental emergency cardiac units in a

few areas which, if successful, could be introduced in the whole country.

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GENERAL PRACTICE IN NORWAY

The number of general practitioners in Norway has decreased by 15 per cent between 1956 and 1966; at the same time the average age has increased by five to ten years. A recent meeting of the Norwegian Medical Society studied the state of general practice today. It considered that the number of general practitioners was decreasing because it was so much easier to continue working in hospitals than to enter the competition and irregular hours of general practice. As in England students are trained by specialists and they follow their example. Most important, the status of the specialist and research worker compared with the general practitioner is so much higher, and the salary of the specialist gives ample chances for easy living and does not demand abnegation. The Norwegian general practitioner finds, in common with those in this country, that his life is far more exacting than in former times, the amount of knowledge he has to acquire has increased and many feel that they don't know enough to do their work efficiently, and, lastly, they have an increasing load of paper-work. The remedies suggested were that general practice should be regarded as a specialty, that general-practice research should be organized so as to increase interest in general practice and that group practice be adopted where local conditions permit. Practice methods should be modernized and paper-work reduced. The unnecessary subdivisions of medical work into mother and child work, children's clinics, sports, industrial and school doctoring should be reduced.