

REVIEW

From apoplexy to stroke

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“... it is a disease in which the functions of relation are suspended, while those of organic life continue. A fit of apoplexy, it has been often observed, resembles in many respects, profound sleep. There is the same insensibility to external impressions, the same unconsciousness of everything that is passing around; the action of the heart and respiration go on in both instances, but the individual is shut out from the world, sight, hearing, smell, touch and taste being abolished for the time”[1].

Introduction

In 1987 Elias [2] charged sociologists with retreating into the present and with failing to use the past to illuminate contemporary problems and issues. A similar charge may also be levelled in medicine, where there is a temptation to draw a firm line between the past and the present, and to dismiss the past as ‘quackery’. In the rare instances when medicine does look into the past there appear to be two tendencies: firstly, to concentrate solely on the pathological aspects of conditions and, secondly, to be interested only in the extent to which previous ways of conceptualizing diseases come close to the modern paradigm. This approach is problematic since it somehow assumes that contemporary knowledge offers the ‘truth’, and that previous knowledge is valuable only insofar as it approximates to this truth. Even brief explorations of the history of contemporary conditions place current treatment approaches in perspective, allowing links to be drawn between the past and the present, but also reminding us that contemporary management is simply “a stage between the past and possible futures” [2].

This paper considers the history of stroke with particular attention to the eighteenth and nineteenth centuries. It considers humoral theories, supernatural

explanations, the theory of ‘apoplectic habitus’, moral notions of intemperance and immoderation and the management of prognosis throughout this period, and attempts to broaden the discussion beyond the existing historical literature on stroke pathology [3–6]. It also reviews the implications of the disappearance of the term ‘apoplexy’ from medical discourse, the emergence of ‘cerebrovascular disease’, and subsequently ‘stroke’. While it is suggested that each term symbolizes a distinct way of conceptualizing the condition, it is also argued that there are many threads and similarities linking past and present approaches to its management. An example of this is the continued onus of responsibility for the illness that is placed on the patient.

Meanings

The first recorded use of the word ‘stroke’ in English literature is in 1599 when “an excellent Cinnamon water for the stroke of Gods hande” was recommended [7, 8]. The principal definition of the word today relates to the act of striking in the sense of a blow given or received [7]. The word conveys the sudden and seemingly random nature of the acute event, and as such describes some of the subjective experience of the person who has been ‘struck’.

Although there was some overlap between medical and lay terms, stroke seems to have been predominantly a lay term, while physicians from the time of Hippocrates up until the first half of the twentieth century favoured the word ‘apoplexy’. As Cooke wrote in 1820:

“The term Apoplexia was employed by the Greeks, and is still used, to denote a disease in which the patient falls to the ground, often suddenly, and lies

without sense or voluntary motion. Persons instantaneously thus affected, as if struck by lightning, were, by the ancients, denominated, *attoniti, syderati*" [9].

These terms come from 'attonitus', the Latin for thunder-struck or stupefied, and 'sideror', to be planet-struck [10].

Apoplexy and its treatment

Humoral theories

The Hippocratic tradition conceived of blood as one of the four humours—the one which held spirit or 'vitality'. Consequently, theories about the causes of apoplexy drew upon this concept:

"The reason of an Apoplexy, and the cause of so sudden a Deprivation of Life, that great Judge, the Prince of Physicians, *Hippocrates*, resolves into a Stagnation or Station of the Blood, whereby all Motion and Action of the Spirits is taken away . . . and that its Motion is stop'd either by sharp Humours, or a *Plethora*, or an Afflux of cold Humours; the last of which he makes not so sudden" [11] (emphasis in original).

Galen (born AD 131) accepted and developed the teachings of Hippocrates. He believed that apoplexy was caused by anything interfering with the flow of the 'vital spirit' to the brain, the purpose of which consisted in inspiration and expiration of the vital spirit [12]. The Galenic influence persisted for centuries and for a considerable period apoplexy seems to have been conceptualized mainly in terms of humoral theory in combination with various theories of obstruction. Many centuries later, Wepfer (1620–95) also believed that apoplexy was caused by an obstruction in the path to the brain, with the result that the brain did not receive enough "animal spirits". (He also clearly pointed to an association between cerebral haemorrhage and apoplexy [13].)

Bloodletting was the most common response to apoplexy, as Robinson makes clear:

"And as the Cause of the Fit, most generally arises from either a Redundancy of Blood or Phlegm obstructing the Fibres of the Brain, and thereby intercepting the Action of the Animal Faculties; so I am sensible that the Remedy first in View is to draw Blood; which is look'd upon as the most sovereign Remedy in all Cases of Apoplexies" [14].

This popularity is perhaps surprising given that in 1628 Harvey had published his theory on the circulation of the blood. As Cunningham points out, "the fact that the blood was known to circulate, and that drawing off

blood at one point was simply abstracting from a circulating mass of blood, seems to have had little if any effect on attitudes towards the importance of bleeding. For bleeding was known to work in practice" [15].

However, there were commentators who argued that in some cases bleeding was not appropriate. Robinson suggested that where there was a "Plethora or Fulness of Blood", bleeding was acceptable since it lessened the pressure on the "animal organs". However, in the case of the "Phlegmatick Apoplexy, where all the marks and symptoms of an impoverish'd Blood appear", he advised that bleeding could kill rather than cure [14].

As the eighteenth century progressed the theory of blood pressure was gradually accepted. While this had little effect on the practice of bloodletting it did seem to influence the rationale for this practice. By the beginning of the nineteenth century, at least as far as apoplexy was concerned, bloodletting appeared to change almost imperceptibly from being a means of restoring the balance of the humours, to a means of reducing the pressure of the blood. For example, Cheyne conveys the idea that in 'plethoric' or 'sanguineous' apoplexies the blood has a pressure of its own: "we find that every vessel within the head has been in a state of excitement . . . the brain is torn up by the blood which they (arteries) had driven out of the course of the circulation" [13]. Cooke argued that, in these circumstances, "what practice can be more rational than that of abstracting blood speedily and freely?" [9]. Schiller notes that in the 1840s cerebral haemorrhage had been related to an increased 'impulse' and that as the century progressed, blood pressure began to be measured more frequently and was found to be high in nearly all cases of intracerebral haemorrhage [16]. By 1892 Osler was advising that measures should be taken to reduce arterial pressure after apoplexy and that this was most rapidly and satisfactorily achieved by venesection [17].

In cases where apoplexy was thought to be due to eating a large, indigestible meal, a "proper stimulating Vomit" and "a warm cordial Purge" were advised, "in case the bowels did not, in Time, freely answer by Stool" [14]. Over a hundred years later Tanner suggested that in some cases, "stimulating enemata (formulae 244, 245) should also be thrown up the rectum" [18]. Although, as will be seen below, there were alternative explanations for apoplexy, many of these existed alongside humoral explanations, and bloodletting, vomits, purges and enemas remained popular responses to apoplexy until the beginning of the twentieth century. For example, although statistical evidence had been gathered early in the nineteenth century which suggested bloodletting often had no effect, or a deleterious one [15], it was not until 1935 that Osler's *Principles and Practice of Medicine* claimed that venesection was no longer considered to be of practical value in cases of apoplexy [17].

Supernatural theories

As with the phrase “the stroke of God’s hande” [7, 8], others, including “the mortal stroke”, “the stroke of God” and “the stroke of justice” [7], evoke both a sense being summoned and of divine retribution. The idea that stroke was in some way a punishment for wrongdoing appears to have been a popular notion amongst lay people for centuries, as a physician observed in 1824: “Hence men are sometimes cut off in the midst of dreadful imprecations and curses, a circumstance which the superstitious vulgar attribute to a supernatural interference of Providence” [19].

Despite the scepticism voiced in this case, however, it is clear that some physicians shared the lay view that the event was in some way ‘otherworldly’. Another physician [20] observed that apoplexy denotes “as it were something supernatural, it is called Sideration or Blasting; for those struck with an invisible Power, falling suddenly to the Ground, and are deprived both of Sense and Motion”.

Apoplexy continued to be referred to both as a “dreadful visitation” [1, 18] and as a “summons” by physicians well into the nineteenth century. Copland [21] provides an example of the latter, relating the warning that Napoleon was given by his physician, Corvisart, with regards to apoplexy: “a first attack, which is often slight, is a *summons without costs*; a second, a *summons with costs*; but a third is *an execution on the person*”.

Predisposition: the ‘apoplectic habitus’

Throughout the period of ‘bedside medicine’, Jewson argues, medical investigators tended to search for universal, first causes of illness, or attempted to identify a general underlying predisposition to ill health [22]. One of the predominant medical theories of apoplexy in the eighteenth century was the ‘apoplectic habitus’. As noted earlier, such theories did not replace the humoral theories, but existed alongside them. As Robinson explained in 1732,

“Those Persons, above all others, are in danger of sudden deaths, that are of an unwieldy, corpulent Body; that have short Necks, strait Chests, and are subject to hitch in their Breathing; great, large heads, with a very sanguine or pale Countenance, if they indulge in a luxurious Manner of Living, seldom escape a sudden, fatal stroke” [14].

One of the explanations for this theory was that a short thick neck and a large head necessitated a larger flow of blood to the brain, but also constituted an impediment to its return from the brain, because of the short turns which the vessels must make [19]. It was also thought that people with large thick heads were affected because this was not the shape associated with intellect. The medical concept of ‘apoplectic habitus’

is comparable to some aspects of modern lay theories about ‘the sort of person who has a heart attack’, whereby similar descriptions of the ‘coronary candidate’ (for example, overweight people with red faces) have been offered [23]. The association between short necks and apoplexy continued to be popular up until the end of the nineteenth century. The first edition of Osler’s *Principles and Practice of Medicine* [17], published in 1892, reveals that the ‘apoplectic habitus’ was still referred to at that time, meaning that this theory appeared in textbooks alongside increasingly complex pathological explanations.

Intemperance and immoderation

In the eighteenth and nineteenth centuries an indulgent lifestyle was thought to be an important cause of apoplexy, but probably only in combination with other factors, as the following example suggests:

“A diet continu’d upon high-season’d Meats, poignant Sauces, and plenty of rich Wines, in Time, heighten the Contractions of the vital Organs, inflame the Blood, fire the Passions, and render the Nerves extremely elastick: and when the Nerves of the vital Organs are wound upto the highest Stretch, they can bear; then the least higher Impulse, from either a sudden Change of the Air, or setting into a thorough Debauch, may crack those noble Springs of Life, extremely disconcert their Action, and put an everlasting Stop to all their motions” [14].

Some physicians noted an association between apoplexy and tobacco in people of certain constitutions, but this was neither a widespread nor a popular observation.

MacLachlan observed in 1863 that “a very frequent cause of apoplexy in old age, (was) the venereal act” [1]. Extremes of passion, particularly of joy, were also thought to be a cause of apoplexy, and in this context Robinson [14] relates a story of a young woman who collapsed and died as she was signing her marriage contract. Osler’s medical textbook noted in 1892 that “the excited action of the heart in emotion may cause a rupture” [17] and this theory persisted into the early twentieth century. For example, the 1946 edition of Price’s *Textbook of the Practice of Medicine* [24] suggested that haemorrhage may occur “during exertion, especially if it occurs at a moment of severe physical strain, or at the height of passion”.

It was commonly asserted that if apoplexy was to be avoided it was important to lead a balanced and moderate life, with constant attention to ‘habitual discharges’ [18]. Muscular exertion of any kind, but especially ‘straining at stool’, was a common medical explanation for apoplexy. Rowley suggested in 1788 that violent passions of the mind, cold weather, tight clothing around the neck, constipation and everything in the least bit flatulent should be avoided [25]. Clarke’s

advice in 1824 was to have regular bowel movements, a quiet life and a moderate diet and to avoid smoking and drinking to excess [19]. An excess of anything seems to have been considered dangerous by some; as Tanner suggested in 1854:

“Where a predisposition to apoplexy is suspected, the individual should avoid strong bodily exertion; venereal excitement; the excitement of drunkenness; violent mental emotion; straining at stool; long stooping; tight neckcloths; too much indulgence in sleep; and warm baths” [18].

Prognosis

Throughout the eighteenth century prognosis after apoplexy seemed gloomy. For example in 1785 Pew noted, “the patient, having recovered more or less the use of the other side, does in some instances drag on a miserable existence for a considerable length of time; but very rarely indeed recovers his former intellectual or bodily health” [26].

This gloominess persisted well into the nineteenth century, as MacLachlan indicates: “Although life may be preserved for the present, the mind is often permanently enfeebled, and the patient ever afterwards unfitted for his ordinary vocations” [1]. However, while pessimism about the chronic stages of apoplexy prevailed, there was evidence of honesty and frankness about prospects for the future. For example, a physician presenting the management of one of his patients wrote in 1715, “there was but small Hope left to expect his Recovery; which I freely told his Friends, they being very pressing with me to give my real Sentiments” [27].

In 1788 Rowley was similarly frank about prognosis: “though it appears a melancholy description, yet it is juster than those delusive doctrines which raise great expectations, and end in painful disappointment” [25]. In the 1892 edition of Osler’s textbook it was suggested that in cases where people were completely paralysed, the friends should be told at the outset that the chances of a full recovery were slight and, in cases where the hemiplegia had persisted for more than 3 months and contractures had developed, “it is the duty of the physician to explain to the patient, or to his friends, that the condition is past relief, that medicines and electricity will do no good, and that there is no possible hope of cure” [17].

The emergence of ‘cerebrovascular disease’

Lawrence [28] observes that towards the end of the eighteenth century a subtle shift began to occur in the conceptualization of disease. Attention began to be paid to the characteristics that people with disease *shared*, rather than what was particular to each case; diseases began to be classified as separate entities. Clinical observation and experience were a

fundamental part of this new approach. However, with the increasingly popular practice of dissection, rather than classifying diseases according to the symptoms which people reported, diseases were classified according to changes inside the body that seemed to deviate from normality. As Lawrence writes:

“Doctors began to search, by post-mortem examination, deep in the body for disorganized anatomy. This morbid anatomy, which they found in the dead house, they identified as the basis of those species of disease which, in the Enlightenment, they had begun to describe and classify by their symptoms” [28].

Whereas apoplexies caused by ‘obstruction’ and those caused by haemorrhage had traditionally been considered as distinct, the theory developed that they were both dependent upon degeneration of the arterial wall [29]. The term ‘cerebrovascular disease’ emerged and apoplexy faded from use. Additionally, evidence from post-mortem examinations from 1877 to 1961 showed that the ratio of cerebral haemorrhage to cerebral infarction had declined substantially over this period [30], raising the possibility that the word ‘apoplexy’ disappeared at the same time because the pattern of onset observed by both lay and professional observers may have been less dramatic and somehow less deserving of the term.

With the emergence of ‘cerebrovascular disease’, a new way of perceiving and responding to the condition was born. The person experiencing the condition began to disappear. At the beginning of the twentieth century, and increasingly as the century wore on, patients become less and less visible in medical texts (and the difference is striking). In the eighteenth century patients had been set in their social context; they and their friends and family were present and almost visible in the texts. This was probably because within the framework of bedside medicine, as Jewson points out, “all aspects of emotional and spiritual life were deemed relevant to the understanding of the functions of the constitution” [22]. However, with the emergence of hospital medicine and ‘diseases’, medicine’s focus was now on the inside of the body, and the disease became more and more separate from the person in whose body it resided.

It was not until the 1950s that new techniques and therapies were developed to explore and modify the internal processes of cerebrovascular disease. Among the first were angiography, cerebrovascular surgery and anticoagulants. The 1956 edition of Davidson’s *Principles and Practice of Medicine* [31] cautiously advocated the use of anticoagulants in the case of cerebral infarctions, while recognizing that their use in cases of haemorrhage could be fatal. As time went on, the dangers attached to angiography also became evident and by 1987 Davidson’s textbook argued that the procedure should only be conducted in cases where surgery was indicated.

The most common form of surgery, developed in the 1950s, was carotid endarterectomy. In the early 1960s Davidson's textbook was optimistic about this procedure but by the end of this decade the profession was more cautious. The 1966 edition of Price's textbook [29] noted that while surgical procedures may restore 'flow' they seldom restored function and by 1987, Davidson's textbook concluded that surgery was rarely necessary or advisable [31].

The emergence of a team approach and 'stroke'

At the same time as efforts seemed to be concentrated on the acute aspects of the condition, important developments were taking place with regard to the chronic stages. Until the late nineteenth century, it seems to have been rare for physicians to discuss treatment of the long-term consequences of apoplexy, although paralysis was often considered as a distinct condition. However, in 1892 Osler's textbook prescribed massage of the paralysed limbs in order to maintain the nutrition of the muscles and to prevent contractures [17]. It was suggested that after a fortnight, stimulation of the muscles by "the faradic current" could be useful unless contractures developed. At the turn of the century, the same textbook displayed optimism about the possibilities for improving the situation of paralysed patients and by 1905 it recorded that in the case of contractures, "it has been suggested that tendon transplantation, or indeed cross suture of nerves, may cause some improvement" [17]. At first this optimism seemed closely bound to experimental treatments using electricity and surgery. However, during the following 30 years or so, while hope in these treatments faded, the general air of optimism remained.

In the 1935 edition of Osler's textbook, the word 're-education' makes its first appearance: "Passive movements or massage, and later re-education should be used systematically, in order to maintain the nutrition of the muscles and prevent contractures if possible" [17]. For the first time the patient was encouraged to be active rather than simply acted upon: "the patient should be encouraged to perform simple movements and exercise himself, and attempt to walk when the acute features are over". Osler's textbooks become steadily more optimistic with each new edition. In 1952 Davidson's textbook first mentions 'physiotherapy' in connection with apoplexy: "As cerebral shock passes off, the patient should be propped up in bed, and when consciousness and co-operation are sufficiently restored, physiotherapy should be commenced, and the patient should be got up into a chair" [31]. The word 'rehabilitation' is introduced in the 1956 edition of Davidson's textbook,

in which the benefits of vigorous and early mobilization are proclaimed. In 1964 Davidson advocates occupational therapy (in addition to physiotherapy) to help re-establish skilled movements and concludes that, "The difference between a useful and a useless limb may be determined by the physical treatment given during the first week" [31].

The professions of physiotherapy and occupational therapy had obviously existed prior to this period; however, war had led to increased demand for physical and occupational therapy services and hence the opportunity to reorganize and consolidate the professions [32]. In the UK the newly founded National Health Service facilitated the possibility of using a team approach within a medical setting.

The absolute numbers of people with stroke increased dramatically after the Second World War, from approximately 20 000 deaths per year in the 1930s to 40 000 in the 1950s and 80 000 in the 1980s. The explanation for this increase is not clear but is partly explained by coding changes, demographic trends and probably a real increase in the risk of stroke [33]. The population ageing over the twentieth century has clearly made stroke a more common condition but, unlike the rise in heart attacks and probably because it predominantly affects older people, it did not result in the birth of a new medical specialty or methods of management until very recently. However, in 1962 the Chest and Heart Association produced a booklet in which the foundations of a new system of managing what was now called 'stroke illness' are clearly depicted [34]. The booklet, entitled *Modern Views on 'Stroke' Illness*, provides a striking comparison with approaches of only 20 or 30 years earlier. A whole range of people were called upon to treat people with stroke, including district nurses, domiciliary physiotherapists, speech therapists, occupational therapists and general practitioners. From this period onwards the word apoplexy faded out of use and the traditional lay term, stroke, was widely adopted by the medical profession. As the Chest and Heart Association booklet noted in its introduction, "the term 'stroke illness' is really a lay term... 'Stroke' however, is a convenient expression" [34].

It is only in the last few years that stroke has begun to receive attention in the UK. In 1988 a major conference recognized the poor quality of service provision for people with stroke and set guidelines for improving the quality of care [35]. In 1991 stroke became one of the key target areas for prevention under the Health of the Nation initiative [36] and in the same year the Stroke Association split from the Chest, Heart and Stroke Association in order to concentrate its efforts on research, prevention and education, as well to provide direct support for people with stroke. Over the same period there has been a move towards establishing dedicated units for people with stroke so

that they can be given acute treatment and rehabilitation by people with enthusiasm, expertise and experience in the field.

Conclusion

This paper has outlined some of the theories of stroke in which patients have been implicated during previous centuries. While the person with apoplexy consulted a physician, and the 'case' with cerebrovascular disease was treated by hospital doctors, the stroke patient is now, theoretically, regarded as an active member of a multidisciplinary team which is working towards the goal of 'rehabilitation'.

What does the adoption of the lay word 'stroke' by the medical profession signify, if anything? A cynical suggestion is that the term was adopted at about the same time as initial high hopes for surgical or drug treatments were dashed; in other words, medicine appealed to the lay model in order to place the onus for recovery onto the patient. On a more positive note, however, perhaps we should rejoice that doctors and patients have found a simple word, stroke, which both find meaningful. It is possible that the adoption of a traditional lay word in preference to a medical category symbolizes the re-emergence of the visibility of the person as opposed to the case, and a renewal of interest in the subjective experience of stroke. As noted earlier, within bedside medicine doctors were interested not only in the physical aspects of their patients, but also in the emotional, social and spiritual aspects of their patients' lives.

While it is true that the doctor's appreciation of the patient's subjective experience was crucial to the patronage system in operation at the time [22], there must have been positive and beneficial consequences for the patient, in terms of being treated as a person rather than a disease, and feeling understood and cared about. If the adoption of the word 'stroke' signifies a move in this direction, then it is something that people with stroke will undoubtedly appreciate [37]. However, while the terms apoplexy, cerebrovascular disease and stroke can be seen to signify particular approaches to managing the condition, it should be recognized that they are not mutually exclusive. The term cerebrovascular disease (and 'cerebrovascular accident') is still in use today among some physicians, suggesting that patients are frequently still regarded as 'cases', probably predominantly during the acute phase.

One of the ironies of the contemporary approach to stroke is that more uncertainty now appears to exist. The frankness that is found in eighteenth and nineteenth century discussions of prognosis seems to have been due to the greater certainty that existed then, which in turn was based on the fact that there were no

treatments in the long term for apoplexy: people either died, got better or lingered on miserably. Now rehabilitation is one of the main contemporary treatment responses to stroke, suggesting a more positive outcome, yet uncertainty remains about its efficacy. The contemporary atmosphere of uncertainty gives rise to considerable ambiguity in communications between patients and health professionals about prognosis. The more treatment becomes available, the more uncertainty this appears to give rise to, as has been found elsewhere [38].

The contemporary management of stroke will doubtless be superseded by many other fashions and phases—some foreseeable, others at present unimaginable. Some may simply be new versions of the past. Responsibility for the cause of the stroke has always been laid firmly at the feet of the individual over the centuries. As noted above, physicians used to believe that overindulgence or excess might bring about a stroke, signifying a moral tone connected with religious ideas about moderation as virtue. This moral tone, often set by doctors, persisted throughout the eighteenth and nineteenth centuries and is still resonant today, despite the increasing salience of a pathological view of disease. For example, Davison and colleagues, in the context of heart disease prevention, found that lay as well as medical theories emphasized abstinence from indulgence [23]. Today people who smoke, do not exercise and consume high cholesterol diets may be regarded as having had the stroke coming to them [39]. Moral explanations will probably always co-exist with pathological explanations, but perhaps they are stronger in contexts where there are no cures since they move the onus of responsibility from the doctor to the patient.

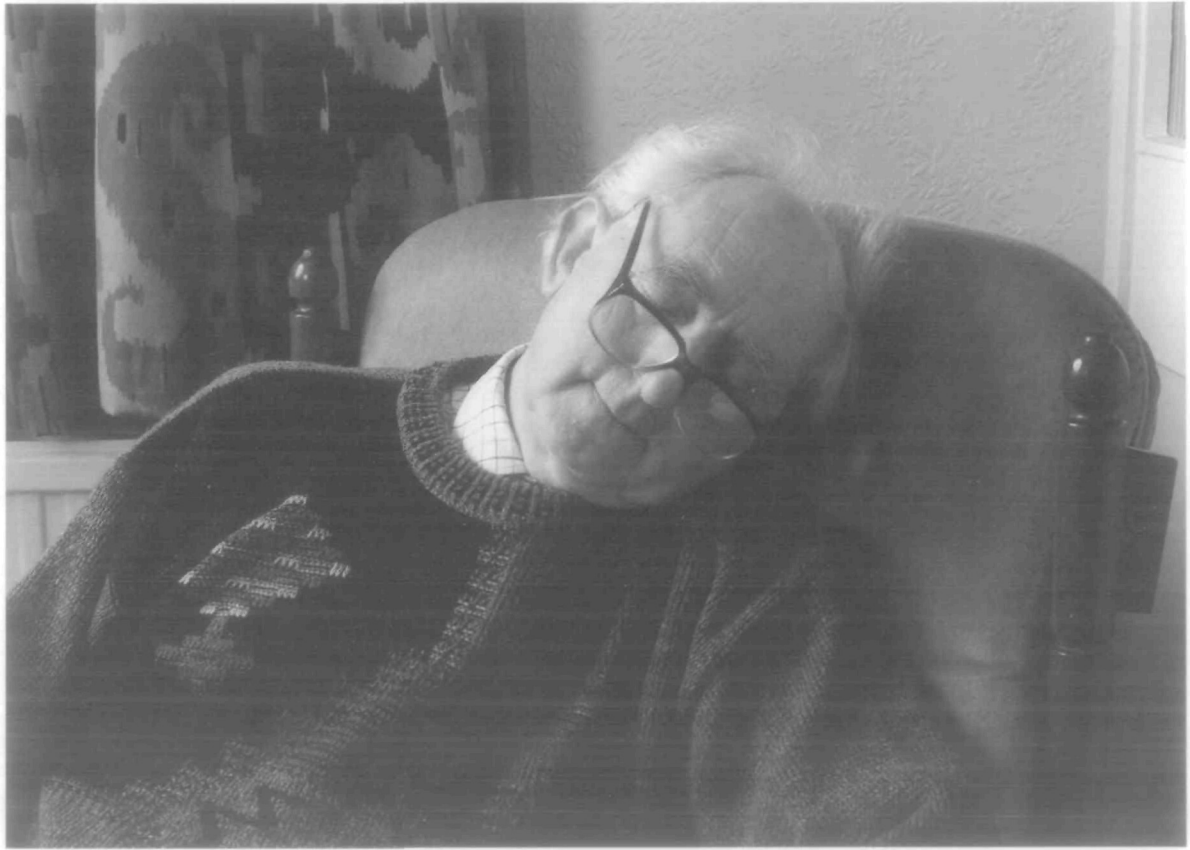
Perhaps another version of past approaches is the increasingly popular trend towards regarding people as 'at risk'. In the field of stroke, a person's risk score can be calculated on the basis of factors such as age, blood pressure, whether they smoke and how much exercise they pursue [40]. In this way, healthy populations are monitored and pathologized; if they do not exercise sufficiently, give up smoking, eat 'properly' and have their blood pressure monitored, they are seen as healthy people waiting to get ill [41], a stroke about to happen. But the desire to identify people 'at risk' is perhaps not quite as new as we think: in the eighteenth century the 'apoplectic habitus' would easily have given it away.

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