The Ellard Collection

Stress

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'Stress' is an essay by the late Dr John Ellard reproduced from the book *The Anatomy of Mirages: a Psychiatrist Reflects on Life and the Mind*.*

Dr Ellard, revered former Editor of *Modern Medicine of Australia* and *Medicine Today* and a distinguished psychiatrist, wrote many essays in the 1970s, 1980s and 1990s on society's most controversial and vexing issues. These were published in various journals including *Modern Medicine of Australia*, and also collected together and published as books. The essay 'Stress' originally appeared in the August 1987 issue of *Modern Medicine of Australia*.

We all know what it is to have a bad day, for who has not returned home irritable, and with a great need for his or her favourite form of relaxation. The English language is provided with a wide range of adjectives whereby such days may be categorised; it is interesting that almost all of them are biologically based.

There being no doubt that ordinary events can have an immediate adverse effect upon one's mind, it becomes necessary to enquire whether or not those consequences can persist and worsen, and whether or not they may involve the body as well as the mind itself. To put the question this way is to stride forth upon a quicksand, for I do not believe that a proper distinction can be made between psyche and soma. Unfortunately there is no easier way to go.

The immediate effects of stress upon the whole person have been recognised for a long time. Walter Alvarez quotes Sennacherib, from almost three thousand years ago: 'The vehemence of my battle line like a bull overwhelmed them ... To save their lives they trampled over the bodies of their soldiers ... with their urine they defiled their chariots and lost their excrements.'[1] The advent of endoscopes of increasing sophistication has permitted the making of more orderly and dignified observations and nowadays every student of physiology knows that the motility, vascularity and secretions of the gut are affected by the emotional state of the person in whom the gut is located. So it is *mutatis mutandis*, with the other organs of the body.

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* Ellard J. The anatomy of mirages: a psychiatrist reflects on life and the mind. Sydney: University of New South Wales Press; 1994. p. 229-241.

The wise physicians

But what of the more enduring consequences, and how much they contribute to the presence of those disorders of structure and function which we call diseases? I had always thought that the great physicians who preceded us, ill-equipped pharmacologically, had perforce become wise about the effect of the passions upon the body. I sought the manifestations of their wisdom on my bookshelves: the search was more difficult than I had anticipated.

Neither the aphorisms of Hippocrates nor the apocrypha which bear his name mentioned any substantial connection.[2,3] For the next two thousand years I can find no more than references to such commonplace observations as rage quickening the pulse, until William Harvey, in discussing some of the reasons why the heart must be the place 'whence heat and life may flow', turns aside for a moment to consider the proposition that 'perchance the reason may be drawn' that the primacy of the heart provides the mechanism whereby 'those with grief, love, cares and the like' may become diseased and die:

For every passion of the mind which troubles men's spirits, either with grief, joy, hope, or anxiety, and gets access to the heart, there makes it to change from its natural constitution, by distemperature, pulsation, and the rest, that infecting all the nourishment and weakening the strength, it ought not at all to seem wonderful if it afterwards beget divers sorts of incurable diseases in the members and in the body, seeing the whole body in that case is afflicted by the corruption of the nourishment, and defect of the native warmth.'[4]

In the same century Robert Burton, that prince of raconteurs, adumbrated on the power of the imagination, asking 'why doth one man 's yawning make another yawn; one man's pissing provoke a second many times to do the like?'.[5] He assembled a long list of

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instances of horrible spectacles which had caused some to lose their wits (as 'Artemidorus the Grammarian ... by the unexpected sight of a Crocodile'), and others to sicken and die.[6] His examples of the more formidable powers of the imagination may not satisfy everyone, as in the case of 'Persina, that Aethiopian Queen in Heliodorus, by seeing the picture of Perseus and Andromeda, instead of a blackamoor was brought to bed of a fair white child'.[7]

There is further evidence to suggest that even though our fathers knew that emotions could affect the body, their minds were not entirely clear upon the matter. For example, still in the seventeenth century, Sydenham described 'hysterical vapours' which might produce pain in various parts of the body but which might also cause jaundice, violent vomiting and death.[8]

In the eighteenth century Heberden noted that asthma can be 'caused by sleep, grief, anger, terror, joy or a fit of laughter'.[9] There are other similar observations in his writings, but in describing how stress can contribute to the causation of hysteria, melancholy and hypochondriasis he stated that the body is nevertheless unharmed by those disorders. 'For every part of the body, as far as our senses can judge, is whole and uninjured by [these] sufferings, great as they are.'[10] As we shall see, he was probably wrong.

Things did not always advance in the nineteenth century. For example, Sir Clifford Allbutt wrote that ' ... among the causes of that kind of Bright's disease known as granular kidney, mental anxiety and prolonged distress take a high, if not a chief place'.[11] That precision of observation does not always signify progress emerges if we compare Burton's Aethiopian Queen with Brittan's report of a lady who consulted him because of her ill health.[12] Noting that her hair was white over the phrenological protuberances associated with Veneration and Marvelousness, but still black in the Hope, he diagnosed that 'she had been fearfully excited in the subject of religion', which turned out to be the case.

By the end of the nineteenth century Osler's textbook of medicine was advancing opinions which would not seem aberrant today.[13] He wrote *inter alia* of the importance of psychological factors in asthma and chronic dyspepsia; five years later he observed that attacks of angina pectoris may be directly preceded by 'mental worry, severe grief or a sudden shock'.[14]

By that time we had progressed as far as anecdote can take us; one of our tasks will be to discover if there is any further to go. I do not propose to devote space to the exuberant hypotheses of the psychoanalysts who, in the first half of this century, contributed theories which related stress, personality and disease in a way which is no longer accepted.

Important clinical observations

The next step is to consider clinical observations which, while not satisfying the tenets of research, may persuade us that a wider enquiry is worthwhile.

Thirty years ago John Hambling demonstrated that not only did the blood pressure of some patients with essential hypertension change significantly depending on the nature of the topic being discussed with them, but also that the resolution of a particular problem could cause a return to normality after a sustained rise.[15]

Twenty years ago Salvador Minuchin and his fellow workers at the Philadelphia Children's Hospital began the researches into anorexia nervosa which were reported in 1978.[16] A preliminary part of their work involved a detailed study of three adolescent girls whose diabetes mellitus was dangerously unstable at home, but not in hospital. The girls were model patients, and the families gave every appearance of being 'stable, helpful, concerned and eager to follow instructions'. Meticulous psychological and physiological investigation over a prolonged period showed that pathological family communications and inefficient techniques for resolving disputes were at the heart of the problem, and that when these disorders were removed so was the difficulty in diabetic control. It may be argued that the pathology was in the group rather than in an individual, but there is no doubt that in those cases a psychological stress produced a significant aggravation of a complex disease.

Equally complicated was the investigation of duodenal ulcer performed by Weiner and his colleagues.[17] They examined 2073 US Army recruits psychologically and also determined their serum pepsinogen, which they took to be a measure of the parietal cell mass. Each recruit had been submitted to the stresses of induction into the army, and of basic training: it does not follow that these experiences were equally stressful for each recruit. Weiner and his colleagues produced data consistent with the hypothesis that the chance of acquiring a duodenal ulcer was related to three main variables.

- A genetically determined physical predisposition – in this case the parietal cell mass. The parietal cells are the cells in the lining of the stomach which produce acid and the pepsinogens which become an active component of gastric juice.

- A stress, as here described.
- A particular personality structure, with particular conflicts in it.

Their results are not only interesting, but also hint at some of the difficulties to be encountered in research of this kind. Having been a recruit amongst recruits I know that while some yearn to become soldiers, for others it is anathema. The level of stress cannot be assumed and is not easy to quantify.

Personality structure is a difficult concept, and in any case some of the building blocks may be hereditary while others are psychogenic. In this particular research there was 'a remarkable correlation between the concentration of pepsinogen in the serum and specific personality characteristics' of the recruits, suggesting a common basis for both variables. As we shall see, things can become more tangled than that.

Very severe stress

To proceed more surely it seems reasonable to turn our attention to experiences very likely to stress any participant, no matter what their strengths and predilections may be. Battles have been prominent in human history, and in recent years Sennacherib 's observations have been extended. Obviously enough the short-term effects of the stress will be psychological, for to be shot, burned or blown up will be a direct result of the battle, and not of the stress. Irradiation was not an option when the researches were performed. Those who doubt the pain and wretchedness of battle should try it for themselves, or read John Keegan's book on it.[18] For the less sceptical one statistic will have to suffice: General S. L. A. Marshall, surveying infantry fresh from combat in the Pacific Islands and in Normandy, found that even in highly motivated units, when hard pressed no more than a quarter of all fighting soldiers had used their weapons against the enemy.[19]

It is reasonable to take the number of physical casualties sustained in a unit of time as a measure of the intensity of fighting. Levav and his colleagues showed in their examination of the Yom Kippur War that the curve representing the psychiatric casualties lags behind that of the physical casualties by a couple of days but has much the same shape; if the lag is corrected the two curves are virtually parallel.[20] The more intense the fighting the greater the proportion of psychiatric casualties. In Normandy 10 to 20% of all battle casualties of the British 21st Army Group within ten days of D-Day were psychiatric; in Italy and Sicily the figure was 11%.[21,22] However, in the Yom Kippur War, which was very intense, 50% of casualties in some Israeli units were psychiatric. This figure 'did not include soldiers whose combats reactions were treated in their units or at the battalion level by Army medical teams or those whose emotional reaction accompanied a physical injury'.

The evidence suggests that if one keeps a unit engaged in heavy fighting long enough the casualty rare will approach 100%. The psychiatric casualty rate will accelerate towards the end, for Swank's study of better than average soldiers suggested that when about two thirds of the members of a unit have become casualties in one way or another, the remaining third will soon break down.[23]

Much more might be said, but I believe that it is safe to accept that a catastrophic stress, such as battle, can cause undoubted immediate psychological harm. Research into other kinds of disasters suggests the same. Questions about how long the harm lasts, and whether or not there are physical accompaniments are very difficult to settle. For example, 55% of the Israeli psychiatric casualties were still medically downgraded at the end of the Yom Kippur War and there was no significant improvement in the group as a whole at the eighteen-months follow-up. It must be remembered that in wartime there are advantages in remaining unfit and certainly in some societies there are persisting advantages even when the war has retreated into the past. Furthermore, the Israeli casualties were treated not at the front but at the rear. There may well have been compelling reasons why this had to be done but in military psychiatry treatment at the rear is associated with a poor prognosis.

Other stressful military operations and experiences may not be as damaging as one might have expected. Flying modern fighter aircraft is an exacting task at the best of times; doing it in a war zone would drain most of us. Researchers at the Israel Air Force Aero Medical Centre took a random sample of the medical records of fighter pilots aged 20 to 24 years in 1968.[24] The mean sitting systolic pressure of the 112 pilots sampled was 122 +/- 12 mmHg at entry, and 12 to 15 years later was 118 +/- 12 mmHg. No very firm conclusion can be drawn from this study except to note that the hypothesis that substantial sustained stress would be expected to produce a rise in systolic blood pressure was refuted.

If one moves from the military world to something more akin to general experience how close is the association between stress and disability then? Almost immediately the data become conflicting and uncertain. Consider, for example, air traffic controllers. Anyone who has ever flown into or out of JFK Airport listening to air traffic control through his or her earphones will have no doubt that it is a taxing occupation. It is taxing enough to listen to it. Here again commonsense is a poor guide. Measures used to quantify stress in air traffic controllers include continuous ECG monitoring, and estimations of urinary 11-ketogenic steroids, adrenaline and noradrenaline. Psychological tests are also used. The results show that in very few towers is the stress level raised, for the indicators rise only in the busiest towers.[25] Equipping the controllers at a busy airport with new automated approach radar (together with better parking, better eating facilities and better air-conditioning) produced no change in some groups and a slight deterioration in others.[26] Crump, reviewing the literature in 1979, came to the conclusion that, in effect, while everyone agrees that air traffic control is stressful no one can prove it and no one can quantify it.[27]

More importantly Booze, in reviewing the morbidity of 28,086 air traffic controllers from 1967 to 1977, could find no evidence that their duties were significantly associated with physical disease: the same result emerged when length of service and age were correlated with the presence of disease.[28] There was, however, an increase in neurosis. A more recent study failed to show an association between air traffic control duties and coronary artery

disease. In short, where one might have expected clear evidence of the presence of stress, and of its consequences, nothing definite has been found.[29]

Everyday stresses

Another approach is that developed initially by Holmes and Rahe.[30] They constructed a list of 43 'life change events' and had large numbers of people rank them for their stressfulness. On this basis each life event was assigned a value, and an ordered list was constructed. Initially it was believed that the list rank order was constant from one culture to another, and when the scale was applied to disparate populations the results obtained were in accord with commonsense expectation. That is, the higher one's score in a given year the more likely was one to develop such a condition as myocardial infarction, peptic ulcer, infection or a variety of psychiatric disorders.

There are, however, problems. In fact there are differences from culture to culture; for example, urban west coast United States citizens ranked marriage fourth in the list of stresses, while a rural North Carolina population ranked it twenty- first.[31] One wonders what the difference signifies.

Another major problem is that the list confuses causes with consequences. Thus some of the items are:

- change in sleep pattern
- trouble with boss
- change in number of arguments with spouse
- fired at work
- gaol term, and
- divorce.

There is no doubt chat they are all disagreeable experiences, but it is possible for a person suffering from biologically determined depression to experience at least some of these events as a consequence of the primary disorder. Again there is the ever-present problem of the retrospective study: the person who has become ill is perhaps more likely to have inspected his or her recent past and discovered events which now seem significant. The healthy person looking back, is more likely to pass similar events by. A three-year prospective study showed no significant connection.[32]

Finally, as we saw in the case of the recruits, the same event may have a very different significance for different people. Rating scales are fallible instruments at best, and this is one of the many reasons why. Attempts had been made to compensate for this failing – for example, to distinguish between the amount of life change produced by an event, and the amount of stress produced by the same event.[33] There are other qualitative differences as well; to put it very simply, most would agree that to be chased by a series of men with axes would be likely to cause anxiety, while to be bereaved repeatedly would be more likely to cause depression. More subtle differences in consequence may well exist. Twenty years after Holmes and Rahe's original attempt to connect everyday stress and everyday disease much hard work has failed to show a clear association: the general tendency is there but the mechanisms and the precise significance of the separate factors remain obscure.

The stress of neurosis

Let us try yet another approach. Most neuroses are burdensome: one might reasonably expect their owners to show secondary consequences of the kind attributed to stress. Sims and Prior investigated all patients treated for neurosis in three Birmingham hospitals during the years 1959 to 1968. Those dependent on alcohol and drugs had been referred elsewhere; most of the patients received ICD diagnoses of anxiety neurosis, phobic neurosis and depressive neurosis.[34]

As expected there was a significant increase in deaths due to suicide, and in accidents which might well have been covert suicides. Putting aside those events there was nevertheless a significant (x 1. 6) increase in deaths due to disorders of the respiratory, circulatory and nervous systems. That the increased death rate can be accounted for in terms of misdiagnosed physical disorders becoming evident is very unlikely, for in the first three years of observation there was a lower death rate, implying that careful assessment at the time of the diagnosis of neurosis had detected intercurrent physical disease.

Unfortunately while the observations are clear their significance is not. It may well be that the presence of neurosis predisposes to the development of physical disease, but other hypotheses may be advanced. For example, a very careful study in Auckland showed that 'anxiety prone individuals who report distressing life events are likely to be smokers and have relatively high alcohol intake, unlike their anxiety free counterparts'. Again, some neurotic people take less care with chronic illness such as hypertension and diabetes mellitus, and achieve a worse outcome. All in all the findings are interesting, but we remain in a state of uncertainty.[35]

Some of the difficulties

Why is the question so difficult to resolve? Why after so much research do we know little more than Osler knew a century ago? Some of the more obvious problems are:

- Even when the stress is massive, as in battle and disaster, significant differences in resilience and outlook exist between one person and another.
- Most common stresses have markedly different significances for different individuals.
- Establishing the results of stress depends in part on the qualities of those subjected to it, such as intelligence, insight and awareness of their own emotional responses.
- Retrospective assessments are probably flawed from the beginning.
- Life changes, as described by some questionnaires, may be stressful for some and welcomed by others.
- Some people may have specific psychological vulnerabilities – perhaps possessing a type A behaviour pattern will make life more difficult.[36] Probably being excessively meticulous has the same result.
- There are genetic predispositions to such conditions as asthma, duodenal ulcer, neurodermatitis, depression, anxiety and schizophrenia which differ from one individual to another.

- Repeated stress seems to harden some and destroy others.
- Being a member of a tightly knit group may improve resilience, as shown by the experiences of POWs. Equally, the loss of such a support may be critical.
- Other confounding variables such as the use of tobacco, alcohol and sedatives, or the presence of secondary gain are not always taken into account. When they are, as in the Auckland study, their role may be central.

What can be done about it?

Many people come to doctors complaining of being stressed, and others appear to be stressed, irrespective of their complaint. As we have seen, the concept is unclear and there is no scientific basis upon which a clear system of management can be constructed. Nevertheless commonsense suggests that something must be done for those who seek help, and commonsense has to be our guide for what we do. In any case I suspect that even when we know more there may not be much change in our management.

First it is necessary to discover what the patient wants. Many turn up, describing formidable difficulties in their lives, and asking how they can be altered such that they are not troubled by them, and if that cannot be achieved, so that they continue to cope nevertheless. In some cases it soon emerges that for complex reasons, usually neurotic, but occasionally realistically based, the patient will not consider doing anything to change the prevailing circumstances, while at the same time making it clear that he or she cannot continue to survive if things remain as they are. At this point I explain that I am not a magician, and that there is no way in which anyone can be altered so as to be able to support the insupportable. Some will then realise that something has to give, and others will depart to look for miracles elsewhere.

Nominated stresses of this kind are usually to be found in close personal relationships, or in employment. This may lead the doctor into anything from counselling a couple to interceding with an exploiting employer. Sometimes this kind of intervention will help, and sometimes it will not: the point is that before one turns one's attention to altering the patient one should give proper consideration to the stressors acting upon him. Even in the most difficult circumstances simple measures may achieve much: for example, mothers at the end of their tether, and likely to harm their small children, may be rescued by the ready availability of a sympathetic and supportive person who makes them a cup of tea and offers help in the house.

Occasionally one encounters the self-indulgent view that these are particularly difficult times, which is why we are more stressed than those who preceded us. I ask those who complain in this way with which ancestor they prefer to change places: one confronting a sabre toothed tiger with sticks and stones, one scratching for a living in pestilence-ridden feudal Europe, or perhaps someone more fortunate enjoying the benefits of surgery, but lacking those of analgesia and antisepsis. In any case – I point out – most such complainants have already reached an age at which almost all their ancestors would have been dead. Much more can be said, but this usually suffices.

Another preliminary step is to consider why the patient is particularly stressed right now. Sometimes the answer is self-evident, and sometimes it becomes clear that there has been a change in the patient's capacity for dealing with the world. Depression, severe anxiety or early dementia may not be apparent at a first encounter: each of these entities will require appropriate specific management.

If one cannot improve the patient's world – or if doing this is not enough – then one has to do one's best to be supportive, and to improve the ways in which he or she handles it. Unless there are very special reasons one should avoid the use of sedatives.

The most useful nonpharmacological measures centre around training in relaxation. The essential step is to put the patient in control of his or her state of arousal, rather than to have it the other way round. There are many techniques; one should follow the patient's choice where it is possible. Some prefer meditation, others yoga – the many techniques probably all arrive at the same place in the end. I happen to favour progressive muscular relaxation, because it is not too far removed from most people's experience, its concepts are easy to grasp, and because – if it is done individually – many patients use their sessions not only to learn the technique, but also to unburden themselves of their troubles. The use of individually recorded instructions, adapted to each person's minor idiosyncrasies, makes it a little easier for the patient to do the necessary practice at home. Having no expertise in the technique myself I have others do the necessary training for me: I doubt that the outcome is affected in any way except for the better.

As one learns more about the patient it may emerge that additional help in the form of assertive training, role playing about specific situations, training in social skills or more formal psychotherapy may be indicated. In this way one is dealing not merely with the present difficulty, but also equipping the patient to do better in the future. From here on one enters upon the management of the whole person and that is too wide a topic to be embarked upon here.

Conclusion

Two and a half thousand years ago the Buddha taught that all existence is suffering. The correctness of his observation has been confirmed again and again since then, but we have learnt remarkably little about what that suffering does to us in the long run. There is no doubt that the skilful practitioner can diminish distress, but as yet the successes are more likely to arise from his or her wisdom and kindness than from the achievements of scientific medicine. MT

References

A list of references is included in the online version of this article (www.medicinetoday.com.au).

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