DIFFERENTIAL DIAGNOSIS OF CONTUSION OF THE BRAIN AND PSYCHONEUROSIS

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The Personal Injuries (Emergency Provisions) Act provides that compensation to civilians injured by enemy action shall be payable only for disablement caused by physical injuries. The diagnosis between contusion of the brain following concussion and psychoneurosis accordingly becomes of great importance, and as it is clear that the distinction presents some difficulty in the certifying of these conditions, it is hoped that the following account of cases I have examined recently for the Ministry of Pensions may be helpful. I have to thank the Director-General of Medical Services for permission to publish the record. The observations are based on an examination of some 300 persons injured in air raids whose disorders had been diagnosed as "shock," "nerve shock," "bomb shock," "concussion," "anxiety neurosis," and "neurasthenia." These people were seen after an interval of three to five months from the incident alleged to have been responsible for their condition, but the notes of those who had been taken to hospital at the time were available. They included persons of all ages from 15 to 82, and of both sexes, with a slight preponderance of women. This long series of consecutive cases afforded an excellent opportunity of comparing the two conditions.

The term "nervous shock," the diagnosis most often used, possesses no medical precision, though it may be convenient and non-committal as a temporary description in the early stages, but its use had been continued in weekly certificates long after accurate diagnosis had become possible. Actually the cases fell into three groups: those showing a typical post-concussional syndrome or chronic cerebral contusion, forming about 30% of the total; those equally clearly suffering from some form of anxiety state—about 50%; and the remainder showing a combination of these two conditions. There was, however, very little correspondence between the diagnoses made at the time of the injury and those which could be made with assurance at a later date.

Influence of Physical Injury

Since the publication of Trotter's papers on head injuries it has been universally accepted that the syndrome of which headache is the most prominent symptom, so often seen after concussion, is the result of physical injury—i.e., contusion of the brain. On the other hand, there is no evidence that physical injury will produce a psychoneurosis, although the contrary view is widely held. If we listen to the evidence constantly given in the county courts we find that many doctors regard it as almost axiomatic that a physical injury may produce or precipitate an anxiety state, which is variously described as "traumatic neurasthenia," "nerve shock," etc., and this is the teaching of at least one of our leading textbooks on medicine. Nevertheless, experience under the Workmen's Compensation Act and in the treatment of ex-Service men suffering from war neurosis has convinced me that where neurotic symptoms become manifest immediately after a physical injury the effect has been produced not by the physical injury itself but by the psychic concomitants of that injury.

The influence of fear and suggestion may be exercised at three stages: before the accident, when the person is in a state of terror, if only for a brief period; immediately after the physical impact, when he finds himself lying on the ground bleeding and in pain, and, for all he knows, may be going to die at once; and at a later stage when, it having been found that the physical injuries are not serious, he is nevertheless sent to bed, certified by his doctor to be suffering from "shock," and treated as if seriously ill. Months later this type of patient may come up in court still claiming to be suffering from "shock," supported by medical evidence, long after physical injuries have been forgotten or are represented by healed, non-disabling scars. As the belief in the physical causation of "traumatic" neurosis is so generally held it is desirable briefly to summarize the grounds for the opposite opinion.

In the first place there is no clinical difference between "traumatic" neurosis and the neurosis resulting from other agencies. The anxiety state in the "shell-shocked" soldier was found, under treatment, to be identical with the anxiety state in the soldier who had broken down during training without having received any physical injury, and to have its root in the same ultimate type of psychological disturbance. The injured workman presents no features not equally met with in the unscathed. Even with the hysterical muscular contractions or flaccid paralyses occasionally associated with an injury to a limb, the injury has done nothing more than determine the seat of manifestation. That it is still the psychic factor which is operative is shown by the fact that these affections correspond to no anatomical lesions, but to the patient's conception of his injury.

Another significant point is the well-recognized fact that "traumatic neurasthenia" is far more likely to be associated with slight injuries than with serious lesions, yet if physical injury is the cause of the condition it might reasonably be supposed that the greater the injury the greater the likelihood of the appearance of neurotic symptoms. The explanation usually given of this fact is that the neurosis develops to meet a wish—escape from the battlefield in soldiers, compensation or damages in injured civilians—and that the seriously injured person has no need to display such symptoms. Wish-fulfilment may be a factor in some instances, although I have long been sceptical of its playing any material part in compensation cases: exaggeration of symptoms in the hope of obtaining a lump sum is not rare, but this is not a neurosis. Another, and probably more important, consideration is that the seriously injured person knows what is the matter with him, and is therefore much less likely to have suggestion of psychic injury forced upon him. He can see for himself an open wound, and he knows what a broken leg means. The victim of "shock," on the other hand, is suffering from an unfamiliar and almost mysterious entity, and it comes to him with all the force of medical authority. There are reasons for thinking that the use of the term "nervous shock" as a certifiable medical disorder is doing as much harm among civilians as did "shell-shock" among soldiers in the last war.

Finally we may note that we do not expect to find neurotic disorders arising from illness from disease, nor do we hear of "post-operative neurasthenia." Yet, apart from the psychic factors, it is difficult to see why there should be any difference between disease and injury in this respect. Where, during convalescence, such symptoms do manifest themselves, it will, I think, again always be found that they are the result of injudicious medical suggestion or over-concern of relatives acting upon persons already of neurotic temperament.

Importance of the History

If the pathological difference between contusion and neurosis is the presence or absence of organic change the history of the incident becomes all-important. In cases presenting the post-concussional syndrome we expect to find, and do find in the great majority of instances, a history of injury to the head followed by a period of unconsciousness, the duration of which may be quite brief. A few of our patients presenting typical symptoms of contusion stated that they did not lose consciousness; but many of those bombed during air raids are dazed and confused at the time and can give no reliable account of what happened to them. C. P. Symonds (1941) states that the group of symptoms forming what he terms the "minor contusion syndrome" may follow injury to the brain without any loss of consciousness, and that their severity and duration have no constant relation to the degree and duration of the unconsciousness if it has occurred. In a few of our cases it was clear that the patient was not unconscious when first struck, but became unconscious after being rescued. Retrograde amnesia was almost always present. Many of the patients stated that their last recollection was that of doing something homely—"making a cup of tea" was often mentioned—and their next was that of finding themselves in hospital or in an ambulance on the way thereto.

On the other hand a large proportion of those who showed anxiety or other neurotic symptoms had sustained no physical injury at all, but had had terrifying experiences. Here is a typical case:

Mrs. A., a middle-class woman, was, previous to being bombed, apparently of normal mental make-up. In December last eight bombs fell in quick succession in the vicinity of her house, and a house two doors away was demolished. Some of the plaster fell from her ceilings and windows were broken, but she was not hit or cut or physically hurt in any way. She was, however, alone in the house and was terribly frightened. Later her husband came in, and in the morning they went together to see her doctor. He told her that she was suffering from "shock" and ordered her into the country at once. She returned in three weeks feeling no better. Examined at the end of four months, her most prominent symptom is terror, with an urge to micturate as soon as she hears an air-raid warning, and at times she has been unable to avoid wetting her clothes.

Other instances have been furnished by members of demolition squads or of fire services who, without having been physically hurt, have found themselves unable to face the terrors of their work. Some describe themselves as having "collapsed" while actually fighting fires or engaged in rescue work; others have carried on through the particular job but have found themselves sick and shaking the next day and have been unable to go back to duty. One man, who had worked for some months successfully as a member of a demolition squad, dated his symptoms from an occasion when, while working on one house, he was ordered to go to another building which had been destroyed, and found it was his own house and that his wife was buried in the ruins.

Some of the neurotic subjects had sustained cuts or burns or bruises, but there was not a single instance of one of them having also received a severe physical injury.

In estimating the psychic factors in these cases it must be remembered that all the three periods of suggestion of injury which, as we have seen, may play an important part in ordinary accidents are much accentuated in air raids. The antecedent period of terror may last for hours and may be very severe in those who have already once been bombed. After the crash, instead of the prompt help which is the rule in ordinary accidents, the injured person may be in a position of danger for a long time and his rescue

may have to be effected while bombs are still falling and buildings are blazing. The person who is unconscious from the beginning is saved the last experience.

The Clinical Pictures

The clinical pictures in the two groups of cases, though superficially alike, are readily distinguishable in most instances. The outstanding feature in contusion is the headache, which is often associated with giddiness. The sufferers complain of it at once, and it may overshadow all other symptoms. They describe the pain as of a stabbing or throbbing character, or as being like that caused by a tight band round the head, and it is the essentially disabling factor in the condition, both for physical and for mental effort. In neurosis, on the other hand, headache is not a typical symptom. It may be complained of, but it is often mentioned only at the end of the story, almost as an after-thought, and it never has the prominence or the apparent severity of the headache met with in contusion.

Inability to concentrate is the other cardinal symptom in contusion, any mental effort tending to make the headache worse. This symptom is best elicited by encouraging the patients to talk freely about their daily affairs—what they do to pass their time, whether they help in the housework, etc. Nearly all will say that they cannot read more than the headlines in the newspapers, as reading makes the headache worse, the eyes sore, and the print become blurred. A characteristic feature is the forgetting to carry out small intentions. The sufferers go out intending to do something, but return without having done it. A woman trying to do shopping now finds she must make a list of the things she is going to buy. "I leave my change on the counter"; "I paid my fare in the bus and then offered it to the conductor again"; "I went to stay with a friend, and left all my luggage in the train," are other actual instances of this condition. The neurotic may complain of inability to concentrate, though if he uses these words he has probably heard the phrase; but when pressed to give specific instances he is often at a loss to find any. He becomes vague, and will make some such reply as, "Well, when I want to do anything." The contused person is often abstracted; the neurotic is usually too self-centred to leave his luggage in a train.

Another point of difference is that the victim of contusion takes a much more hopeful view of his future than does the neurotic. Contusion is an affection from which we expect recovery, and nearly all our contused patients stated that they felt definitely better than they had done a month or six weeks previously. The anxiety state, on the other hand, is a persistent disorder, and those suffering from it will rarely admit to improvement in so short a space of time.

Finally the general mental attitudes are different. The contused person goes straight to his major symptom—the headache. The neurotic is often vague. "It's my nerves," "I cannot explain myself," "I am a perfect wreck," are frequently his opening complaints; while others dilate at once upon their terrors during air raids. As they tell their life stories the differences in their personalities gradually reveal themselves. Many of the contused persons have led active vigorous lives and seem more concerned about getting back to their work than anything else. Two women ambulance drivers seen in succession were obviously minimizing their symptoms in the hope that they would be found fit to resume their duties. Those with anxiety states, on the other hand, belong to the "tender-minded" section of the community. Many of them show great courage in facing their difficulties, but much of this courage must be expended in overcoming an internal enemy from which their sturdier brethren are happily free.

The two groups described above comprise a large proportion of the total and are easily distinguishable, but a certain number of cases in which both sets of symptoms are present to a variable extent offer some difficulty in diagnosis. We have to remember, however, that a person already suffering from an anxiety state may sustain concussion, and the contused person may develop some of the indications of the excessive fear reaction now to be considered.

Influence of Fear

I have so far spoken of "neuroses" in rather general terms, but there is one condition presenting a very definite picture which calls for detailed consideration. It was shown by a large proportion, certainly not less than two-thirds, of the cases classed as neuroses, and it was exhibited equally by men and women. These people start off at once by describing the terror they feel as soon as they hear an air-raid warning or gunfire. They begin to shake; some feel sick—"my stomach turns over" is a frequent description—and some even vomit; others have an immediate urge to micturate, and some have attacks of hyperidrosis. They cannot go on with their occupations; some feel impelled to rush out into the street; others run to the nearest shelter. At night they lie awake listening for warnings. Apart from these attacks of terror they have no complaints. Under examination they may show a tremor of the hands and eyelids and a somewhat quickened pulse.

Many of these people have led strenuous lives, often following occupations demanding judgment and "nerve," and no evidence of a neurotic tendency can be found in their personal histories. Their occupations have included lorry-driving and bus-driving, steel-erecting, tunnelling, plate-laying, shunting, etc., and important clerical and administrative work. The women have brought up families, run businesses, and held responsible jobs. They have carried on at their work until the incident occurred which affected them, and some express their profound shame at finding themselves in their present state. Here are two typical instances:

A man, married, with four children, served in France, Egypt, and Gallipoli in the last war. On discharge with the rank of sergeant he became a park-keeper in a London park and subsequently head park-keeper. He had a considerable staff under him and had important A.R.P. duties in the park, which he discharged satisfactorily until one night when a bomb fell near but did not physically hurt him. Since that date he has been unable to go on with his work as he cannot control his terror during air raids.

Another man served in France in the last war and had a good record. For twenty years he was a London bus-driver. In January of last year bombs fell near him, and he saw another bus wrecked and the driver blown to pieces. He cannot now drive in London, and has been placed in a quiet outlying district; but whenever he hears a warning he must go at once to the nearest urinal, and sometimes wets his clothes.

These people feel sure that they would be all right if they were transferred to a safe district, and there is every reason to believe that they will again become normal citizens after the war.

I do not think this condition should be regarded as a neurosis at all. It has not the deep-seated foundations of an anxiety state and is simply an accentuation of the normal response to threat of danger. The reaction caused by a physiological stimulus which is excessive or prolonged is apt to be re-evoked when the stimulus is repeated in much milder form or even when there is merely a threat of such repetition. Examples are not rare in compensation claims. A familiar instance is afforded by the workman who once having had a serious fall is afraid to work at a height again. A youth who rode a carrier cycle in the City recovered completely from a bad accident, with the exception that he dared not ride again in crowded traffic.

Many persons are familiar with the condition in a minor form; speaking of a terrifying experience, they will say, "It makes me shudder to think of it again." Looking back, we can see now that many of the cases described as "shell-shock" in the last war fell into this category. These symptoms are really in the nature of conditioned reflexes, and we can postulate no more about their aetiology than that those who display them have a rather greater susceptibility to the fear stimulus than their fellow-men—a remark, however, which might be made about every form of disease. To describe this condition as anxiety neurosis, as ordinarily understood, is to suggest for it an aetiology for the existence of which there is no evidence. We require a term which shall simply define the condition without making any suggestion as to its fundamental origin, and none of our present names meet this need. "Commotional shock" and "emotional shock," terms used by Mott in the last war, have been recently revived; but the former seems to me to amount to concussion, and the latter to be our old friend "traumatic neurasthenia" under a new name. All these words carry implications with them, just as did "shell-shock." It would simplify the problem of handling these cases if they were lifted entirely out of the category of the neuroses; but this can never be done so long as they bear a designation indicating a neurotic origin. I have been accustomed to describe the condition in reports as "exaggerated fear reaction," which leaves the question of the aetiology entirely untouched; but a Greek cloak is kinder, and I suggest "hyperphobosis"* instead. The condition is not new. Job is our exemplar of withstanding adversity, yet he too felt it, and described it in the words: "In thoughts from the visions of the night, when deep sleep falleth upon men, Fear came upon me, and trembling, which made all my bones to shake. Then a spirit passed before my face; the hair of my flesh stood up." (Job iv, 13.)

REFERENCE

Symonds, C. P. (1941). *Injuries of the Skull, Brain, and Spinal Cord*, ed. S. Brock, p. 96, Baillière, London.

SULPHONAMIDE TREATMENT OF HYPOPYON ULCER OF THE CORNEA

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The sulphonamide group of drugs have found a place in ocular therapeutics in this country, particularly in the treatment of ophthalmia neonatorum. Bellows and Chinn (1939) demonstrated that sulphanilamide penetrates to the ocular fluids and tissues in suitable and efficient therapeutic concentration when given by mouth, but not when applied topically. Luo and P'an (1940) obtained quite different results when they experimented on human eyes. Concentration in the aqueous after instilling 1% sulphanilamide was roughly the same as after oral administration. After applying the drug in powdered form the concentration in the aqueous was from five to eight times as great.

The present article is the record of a clinical experiment directed against a particularly destructive corneal condition—hypopyon ulcer. Because the pneumococcus is often the organism involved in the condition sulphapyridine was chosen as the chief though not the only weapon. The experiment began in June, 1939, with the use of sulphapyridine eye-drops as a 0.07% solution in saline isotonic with the lacrimal secretion.

* *ὑπερφόβος*, "very fearful, timid" (Liddell and Scott).