for negligence. So the question remains: how do we persuade the surgeon to take some action?

APPOINTMENTS OF OTHER SPEAKERS

- (1) Professor H. A. Dudley, M.S., F.R.C.S., Professor of Surgery, St. Mary's Hospital, London.
- (2) Dr. M. C. Bott, M.B., M.R.C.Psych., Consultant Psychiatrist, Hellingly Hospital, Hailsham, Sussex.
- (3) Dr. J. M. Forsythe, M.B., M.F.C.M., Area Medical Officer, Maidstone.
- (4) Dr. R. Wood, M.B., M.R.C.P., Consultant Physician, Bridge of Earn Hospital, Bridge of Earn, Perth.
- (5) Dr. A. J. M. Cavenagh, B.M., D.Obst.R.C.O.G., General Practitioner, Brecon, Wales.
- (6) Dr. N. D. L. Olsen, M.B., M.R.C.P., Medical Registrar.
- (7) Dr. A. J. Smith, B.M., B.Ch., Assistant Editor, *British Medical Journal*.

- (8) Dr. M. Ware, M.B., F.R.C.P., Editor, *British Medical Journal*.
- (9) Dr. S. P. Lock, M.B., F.R.C.P., Deputy Editor, *British Medical Journal*.
- (10) Dr. A. Colling, M.D., F.R.C.G.P., General Practitioner, Stockton-on-Tees, Cleveland.
- (11) Dr. N. K. Shinton, M.R.C.Path., F.R.C.P., Consultant Haematologist, Coventry and Warwickshire Hospital, Coventry CV1 4FH.
- (12) Dr. R. H. Hardy, D.M., M.R.C.G.P., Casualty Officer, Hereford General Hospital, Hereford.
- (13) Miss Jacqueline Flindall, S.R.N., S.C.M., Area Nursing Officer, Oxfordshire Area Health Authority.

References

- ¹ Popper, K. R., *The Logic of Scientific Discovery*. London, Hutchinson, 1959.
- ² Doll, R., and Bradford Hill, A., *British Medical Journal*, 1964, 1, 1460.
- ³ Mather, H. G., et al., *British Medical Journal*, 1971, 3, 334.

Outside Europe

Changing Incidence and Pattern of Trauma in Jamaica*

J. S. R. GOLDING

British Medical Journal, 1974, 4, 333-335

Introduction

Two major achievements have affected medicine in the twentieth century: firstly, the improvements in preventive medicine, epidemiology, and social conditions—which have affected everyone in the community—and secondly, the exciting advances in curative medicine, neurosurgery, cardiac surgery, intensive care, total joint replacement, and anaesthesia—which are wonderful but affect comparatively few people in the community.

So far as trauma is concerned the improvements in techniques and methods of treatment will continue to occur. But the effect on the efficiency of treatment will be marginal. Indeed, saving those who used to die presents its own major problems in costly and prolonged aftercare and rehabilitation. It is obvious that trauma has become one of our major health problems. As many as 30% of the hospital beds in Jamaican government hospitals are occupied with trauma cases, and we must rely on an epidemiological approach if we are to avoid becoming overwhelmed. We must plan ahead to have the organization available to treat the sort of patients we are likely to see, in the sort of numbers that we are likely to have. This means that our undergraduate and postgraduate teaching must be directed towards the problems that will occur in the future, and not be merely a regaling of our skill in dealing with the problems that existed 20 years ago when we, the teachers, were at our most active and most im-

pressionable. I believe our problems are very similar to those in other countries, but the developing country has the additional problem of excessive rate of change. For instance, it took us over 10 years to learn to treat tuberculosis efficiently in the 1950s and by the 1960's skeletal tuberculosis had virtually disappeared.

Increase in Work Load

In 1953 the population of Jamaica was about one and a half million; it is now almost two million. Nevertheless, the work load at the university hospital has increased five times to over 10,000 cases a year in this period, which is much greater than one would have expected from the population increase. The increase in violence and the number of motor cars—and hence the number of accidents—and the fact that more patients come to the main centres for treatment because of transport facilities have improved have all contributed to this increase in work load. The amount of major injury has increased from about 100 cases a year in the 1950s to almost 600 a year now, and the number of night emergencies has increased slowly and steadily. This puts considerable strain on the medical staff who are expected to work during the day when they have been up for all or part of the night.

Change of Emphasis

One of the most important aspects in the training of young surgeons is the variety of works they will be exposed to. In 1954 32% of our work was traumatic; by 1973 almost 70% was entirely the result of trauma. Because so many of the cases are emergencies they are seldom seen by medical students and are not available for class teaching. In fact, it is difficult to get routine cold admissions into the university

*Based on an address given to the Annual Clinical Meeting of the B.M.A. in Jamaica, April, 1974.

hospital and it is more and more difficult to get good representative teaching cases for students and postgraduates.

The major surgery that we do has increased and changed in character. In 1963 we were operating on 350 cases of major trauma and 530 orthopaedic cases, but in 1973 the numbers had almost exactly reversed and we were dealing with 570 cases of major trauma to 370 orthopaedic cases. Part of this, of course, was due to the fact that we had been able to cope with the large amount of neglected deformity and because the effects of infection had decreased because of good early treatment.

The rapid increase in the number of old people in the community is mirrored in the increase in degenerative disease and fractures—particularly fractures of the neck of the femur. We have had over six times the number of cases of fractured neck of femur to deal with in 1973 than we had in 1954. This increase is also reflected in the surgery that we have done for other conditions—for example, scoliosis. Possibly early detection is part of the reason for this, but in fact most of the cases present fairly late. It is also possible that the changes that have occurred in the incidence of other conditions, such as acute appendicitis (probably with a dietary basis) may also be the basic reason for this peculiar increase in the incidence of scoliosis.

Trauma due to Motor Accidents

Undoubtedly motor vehicle accidents have become one of our major problems. In 1961 there were about 42,000 cars in Jamaica; in 1970 there were 72,000. Between these years there has been an increase from 421 to 533 deaths per 100,000 vehicles and the deaths per 100,000 of the population have almost doubled in the same time. The number of motor vehicles per person in Guyana is one to about every 25 people; in Jamaica it is about 18, but this has decreased since 1970. In the United Kingdom there is one motor vehicle for just over three people and in the United States one to just under two of the population. Nevertheless, if we analyse the deaths per 100,000 motor vehicles, we find that Guyana and Jamaica have over 50 whereas in the United Kingdom the number is four and in the United States five. The death rate is a more interesting and significant way of analysing how a country is coping with its motor vehicle problems. In Jamaica the death rate per hundred million miles driven has increased from 35 in 1961 to 38 in 1970. In the United States, with their greatly increased density of motor vehicles per head of the population, the death rate per hundred million miles driven has decreased.

The worst offender of all is, of course, the motor cyclist. Though in Jamaica there are about 12 cars to every cycle, the number of motor vehicle accidents attributed to motor cycles is almost half of the total. The number of motor cycles on our roads has increased five times between 1957 and 1968, and the number of deaths due to motor cycles has increased six times over the same period.

One of the major factors has been found to be alcohol. In a survey by two of our medical students, who analysed the severe motor vehicle accident victims admitted to the Kingston public hospital and the university hospital over a three-month period, it was apparent that 45% were grossly under the influence of alcohol and admitted to having taken alcohol within an hour of the accident.

Fractures of Tibia and Femur

We must now turn to individual problems which cause overcrowding in our wards and the major problems of treatment. Among these are the fracture of the tibia or femur and traumatic paraplegia. Patients with fracture of the tibia or the femur occupy more bed space than almost any others. The numbers have increased steadily from the 1950s to the

1970s—over ten times the number of injuries of the tibia requiring inpatient care and just under ten times the number of fractures of the shaft of the femur. The increase in the number of compound fractures of the tibia cannot be divorced from the number of motor cycles now on the road. We have had to devote considerable time and attention to reducing the time these patients can spend in hospital as well as their subsequent morbidity. The difference between the time in hospital and the time off work for a simple fracture of the tibia as opposed to an open fracture is appreciable indeed, but there is little that we can do at present to reduce the time which these patients have to spend in hospital.

Nevertheless, we have been able to reduce the time for the treatment of the fractured femur, and the Kuntscher nail has been a great boom to us, provided suitable cases are carefully selected. The disasters have occurred when somebody who has been only partially trained in orthopaedics has done intramedullary fixation of the fracture in a hospital where sterility is not as satisfactory as it should be. In our hands the Kuntscher nail has on average got the patient out of hospital quickly and back to work within four months of the injury.

But this technique does not help us with the treatment of compound fractures of the femur. These we treat by the very simplest method we can: the Perkin's method, which aims to bring the leg out to the right length as rapidly as possible and to get the knee bending as soon as possible so that by the time the patient has a healed fracture the knee is able to flex to at least 90°. If only we could get this method adopted by all the hospitals on the island we would avoid the unnecessary shortening which we see too often and the unnecessary knee stiffness which is still the rule. The beauty of the method is that it is cheap and simple. An ordinary hospital bed with springs removed is used. Bed boards are put under the mattress so that they can be removed in the lower section, allowing the mattress to bend down so that the patient can exercise the knee while still lying in bed. A Steinmann's pin is used and cords are tied directly to the pin. If possible a threaded pin is used because it holds more securely in the tibia and, if no movement occurs, there is little or no soreness around the pin tract. We have also designed a simple device for applying traction to the leg made out of an ordinary reinforcing bar with a piece of tubing which moves freely on the transverse section. This costs very little, any sort of weights can be used, and in practice the only piece of equipment that is needed for the satisfactory treatment of the comminuted or compound fracture of the shaft of the femur is a tape measure to ensure that the limb is out to length.

Traumatic Paraplegia

Traumatic paraplegia is a major problem in all communities, particularly in a developing community where expensive services must always lag behind the everyday needs. Cases of paraplegia resulting from motor vehicle accidents have increased fairly steadily over the years, but those due to gunshot wounds even more sharply. As one would expect, the cases of paraplegia seen in women are vastly less than in men. The level of injury caused by these major classes of accidents is also interesting—for example, cervical injuries are particularly common in motor vehicle accidents while dorsolumbar injuries are particularly common in gunshot wounds. This is because a person with a gunshot wound of the chest and neck usually dies.

We have seen that improved facilities of transport have meant an increased amount of traumatic surgery and the number of attendances in the clinics due to surgery. Nevertheless, much disability could be saved if students were taught which cases should be transferred early to a major centre and our postgraduates and surgeons in the smaller

hospitals realized which cases they should transfer immediately. In most cases it takes no more than two hours to move a patient from any hospital to a major centre, and it is in this area of improved transport of a patient to the major centres that the greatest improvement in our treatment could be achieved. A railway ambulance car would help more than any other single thing in an island such as ours.

One of the problems that always besets teachers is to know what the student should be taught. I think that the basis of what we should teach every student, certainly as far as trauma is concerned, is what every doctor should know. Whether he be a general surgeon or physician or gynaecologist or orthopaedic surgeon, there are certain basic principles in treatment of patients which all of us should know and that is what should be implanted in our students quite firmly. We have to resist the tendency to try and make them into miniature specialists or replicas of ourselves.

The next important area where knowledge should lead to wisdom is that of continuing education. The student must be made to realize from the very beginning that all his teachers

are trying to do is to set him on a course which he will continue for the rest of his life—namely, self-education. This implies the attendance at meetings and regular medical conferences. It is unfortunate that those who attend conferences really need to attend least. It is those who do not like going, who seldom read their journals, and are rapidly out of date, and then are afraid to go in to meet their peers because it is obvious that their knowledge is poor, who debase the standard of patient care.

The thought that I would like to leave with you is contained in a verse from Couper:

"Knowledge and wisdom, far from being one,
Have 'oft times no connexion. Knowledge dwells
In heads replete with thoughts of other men,
Wisdom in minds attentive to their own.
Knowledge is proud that he has learned so much,
Wisdom is humble that he knows no more."

If we humbly look into our patients' needs and realize that that is what this conference, all conferences, and teaching is about, we will indeed have learnt a great deal.

Abdominal Injuries

A. D. ROY

British Medical Journal, 1974, 4, 335-336

The abdomen is easily injured, and, when threatened, one's instinct is to protect it because it contains vital organs. It can be penetrated by weapons or missiles, or damaged by blunt trauma. In this violent world the incidence of abdominal injuries is rising and there are three main causes: road traffic accidents; industrial and domestic accidents; and civil and military violence.

The first cause is by far the most common in most parts of the world, and may be regarded as a disease which has reached pandemic proportions. Local epidemics of civil and military violence alter the pattern, but these are usually temporary episodes. Until 1915 the recognized treatment of both closed and open injuries of the abdomen was conservative, operation was not advised, and the mortality rate was very high. In fact, the surgery of the injured abdomen has a very short history.

The division of injuries into those that are due to blunt injury, and are therefore closed, and those that are due to the penetration of the abdomen by a sharp object or missile, is valid. Injury to the adjacent parts of the body, or even occasionally remote areas, may involve trauma to the abdomen: a missile may enter the upper thorax and yet penetrate the abdominal cavity. Conversely, injury which is apparently at first confined to the abdomen may involve injury to other areas—for instance, rupture of the diaphragm is not uncommonly the result of blunt injury to the body. When the injury is closed the trunk and pelvis should be carefully examined for bruising and abrasions to determine how the trauma had been applied. Fractures of the lower ribs will indicate the likelihood of injury to liver and spleen, while fractures of the pelvic girdle will indicate the possibility of injury to the bladder or urethra. Fractures of the transverse spinal processes are often associated with injuries to the kidney. In missile injuries the entry and exit wounds should

be correlated with the probable passage through the body taking into account any bones which may have deflected the missile. If there is no exit wound the position of the missile in the body must be determined.

Head injuries may conceal a major abdominal injury. Loss of consciousness and flaccidity of muscles will conceal the symptoms and signs and the need for craniotomy or respiratory support may distract attention away from the abdomen. Patients with head injuries should always have a careful examination of the abdomen and it must be emphasized again that head injuries do not cause hypotension. If a patient with a head injury is shocked it is probably because of some other lesion and this possibility should be carefully investigated.

Resuscitation

Resuscitation must be started immediately the patient is admitted, and go on while the injury is being assessed. With one exception the patient should be stabilized before laparotomy is carried out. This exception is when a major vessel has been damaged: in this case the haemorrhage must be controlled rapidly. A quick laparotomy to stop haemorrhage can be followed by a pause for resuscitation before repair of the injury proceeds.

Closed injuries demand an early decision for or against laparotomy and, in general, if any doubt remains whether there is damage to a solid or hollow viscus or whether haemorrhage has occurred then laparotomy should be performed. Needle aspiration of the four quadrants of the abdomen is safe and a positive result is valuable. The aspiration of either blood, gas, or faecal matter is significant. A negative result does not exclude the need for laparotomy. Plain radiography of the abdomen is less helpful. Evidence of free gas, or in late cases of ileus, may be helpful, but a negative reading of the x-ray films should not be allowed to override clinical signs.

Open or penetrating injuries due to missiles, knives, or other sharp objects must be explored. Missile injuries are the most complex because of the deflection of the missile in the tissues and the velocity of the missile. Low velocity