The toxic reactions were both immediate and remote ; as shown in the two tables they were considerably more frequent in the tryparsamide series than in the neocryl group. The commonest immediate reaction was nausea or actual vomiting, and this was in most cases easily controlled by premedication with glucose. Nitritoid crisis was never encountered. Some patients complained of vague body pains in the first twenty-four hours after injection, but these seemed to be of little moment and no ill effects were observed on continued administration of the drug. The later effects comprised jaundice, dermatitis, albuminuria, neuritis, herpes, and visual disturbance or damage.

One death occurred in a taboparetic who had received 57 grammes of neocryl and developed jaundice. Purpura was seen in a case of tabes under treatment with tryparsamide.

In the event of visual disturbances, such as the sensation of flashing lights or shimmering vision, the drug was withdrawn and the patient kept under observation by the ophthalmologist. If permanent damage was reported the same drug was not given, but if no damage was apparent treatment by pentavalent arsenicals was restarted with caution, and preference given to neocryl. Neocryl did not cause any functional visual disturbance, but in one case after nine doses of 3 grammes sudden and complete blindness occurred. The blindness which followed in 3 cases treated by tryparsamide was gradual in its development. In 3 cases optic atrophy present before the administration of neocryl became worse, but in 9 other known cases no ill effect was produced.

Summary and Conclusions

A series of 570 unselected cases were treated either with tryparsamide or neocryl. The drugs were given in equal amounts, and 256 received tryparsamide and 314 neocryl.

About twelve months after the work had been completed a survey was made of the records with a view to comparing the therapeutic effects and toxic manifestations of the two compounds. This survey confirmed the earlier impression that neocryl is not in any way inferior to tryparsamide as a therapeutic agent and that toxic effects from its use are much less common than are those caused by tryparsamide. Of 256 cases treated with tryparsamide 78 exhibited toxic manifestations, whereas of 314 cases treated with neocryl only 27 showed toxic signs.

Both compounds may cause jaundice, dermatitis, and other undesirable reactions that are seen after the administration of trivalent arsenicals ; but it is chiefly in its relative innocuity to the optic nerve that the advantages of neocryl become apparent.

Visual disturbance occurred in 47 of the 78 cases which reacted unfavourably to tryparsamide: in 36 of these the signs were subjective, but in 11 they were objective, 3 of the latter patients becoming totally blind.

Neocryl could, however, be held accountable for only one case of visual damage. This occurred in a patient with tabes dorsalis, who unfortunately became suddenly blind ; before treatment the patient did not complain of subjective signs and the acuity of vision was apparently good, but it was not possible to have his eyes examined by an ophthalmic surgeon.

It would appear from this analysis that neocryl is to be preferred in all cases of neurosyphilis in which the administration of pentavalent arsenicals is necessary.

REFERENCE

Yorke, W., *et al.* (1936). *British Medical Journal*, 1, 1042.

RECEPTION OF AIR RAID CASUALTIES

BY

H. A. BRITTAIN, M.Ch., F.R.C.S.

AND

K. A. LATTER, M.D., M.R.C.P.

Successive air raids have led to the modification and improvement of the preconceived scheme for the treatment of air raid casualties in a large provincial hospital. The following scheme may serve as a basis for further modification according to the needs and capacity of various hospitals. As the hospital here discussed contains a first-aid post, in practice the majority of casualties have been arriving direct from the scene of the raid ; but the scheme would also serve, with slight alterations, for patients already treated in a first-aid casualty post remote from the hospital.

Obviously some medical officers will have to fulfil dual roles. The rapid disposal of patients after a raid is of the greatest importance so that a surgeon or physician who has finished his examination in the out-patient department may be available in the wards or theatres. In the wards the patients are seen and examined by a senior surgeon and physician, and a preliminary note is taken at the bedside. It is suggested that a form similar to the one printed below may be found useful in briefly recording the pertinent data. The use of the figures for charting multiple injuries and lacerations offers a more rapid and comprehensive record than a long description.

SURGEON

Name.....Age.....Sex.....Date.....

Address.....Time of
Admission.....

Description of Injuries :

Notes :

Degree of Shock :

Mild

Moderate

Severe

Treatment :

Morphine
A.T.S.
Fluids : Mouth ..
Parenteral..
O₂ : Method ..
Duration ..
Flow ..
Cortin

Time			

Anaesthetic Time

Operation

Immediate convalescence :

DIAGRAM OF SCHEME FOR RECEPTION OF AIR RAID CASUALTIES

Casualties are admitted at the out-patient entrance as indicated by the broad black arrows (top left). Walking cases so far have been approximately 50%. They are treated in the cubicles on the left by either an assistant surgeon or a B class resident. They resolve themselves into three categories: (1) those requiring minor operations; (2) those requiring rest; (3) those fit to depart after treatment. The stretcher cases, if arriving in large numbers, are placed in a reception room, the first stretcher being situated furthest from the door so as not to block the passage-way. One medical officer is present to determine urgent priority; otherwise the cases pass into the examination room in the order of arrival. The hospital stretcher-bearers take them into the examination room, where they are placed on three trestles for a preliminary examination. This is undertaken by three surgeons, morphine and anti-tetanic serum being given where indicated. They are then sent to various destinations: the general wards or orthopaedic block, where a more complete examination takes place and resuscitation is carried out; the x-ray department; the theatre block; observation wards; or the mortuary. There is, of course, a separate entrance for gas-contaminated cases.

Treatment of Shock

It is essential next to estimate the degree of shock present, and to institute as rapidly as possible the appropriate treatment. Shock may be classified as mild, moderate, and severe according to the following scheme (Keith, 1919):

GROUP I

Mild Shock.—General condition good. Pulse rate between 90 and 110. B.P. 100 mm. Hg. No haemoconcentration.

The vast majority of patients falling into this category will respond satisfactorily to general measures:

(a) Absolute rest with freedom from manipulation. Severely traumatized extremities will require preliminary splinting, unless this has already been carried out at a first-aid post.

(b) Warmth applied by carefully protected hot-water bottles or the electric blanket: under conditions of winter, a special room kept at constant temperature may be used for this purpose. Hot fluids such as tea or coffee with two drachms of glucose added to each cup are useful. Morphine should be used to combat restlessness and pain, but in the absence of both these factors its use should be restricted, in view of its depressing effect upon the respiratory centre.

GROUP II

Moderate Shock.—General condition fair. Cold numb extremities. Pulse: volume diminished; rate, 120/140. B.P. below 90 mm. Hg. Haemoconcentration.

In this group there exists haemoconcentration, but the vascular system is still able to take up fluids, and the capillary endothelium has not lost its power of retaining colloids. Treatment will embrace general measures as in Group I, but in addition it is considered that plasma obtained by decanting the supernatant fluid from citrated blood is the most suitable and accessible intravenous fluid. It will frequently be found necessary to cut down upon the collapsed veins and insert a

cannula. Time may be lost by attempting to introduce a needle into a vein which is almost emptied of blood, and, in so far as the blood viscosity is much increased, the flow through a wide-bored cannula is less apt to stop or to form clot.

As a guide to the effects of treatment red cell counts are probably the best indications of haemoconcentration. If, however, these are not easily available an estimation half-hourly of the blood pressure will serve. It is found that following treatment and the administration of plasma there is a decrease in haemoconcentration and a rise in the blood pressure. Within an hour or two, however, the condition of the patient may again become critical, requiring a second or even a third infusion.

GROUP III

Severe Shock.—Pulse almost impalpable—120/160. B.P. 60 mm. Hg or less. Haemoconcentration marked.

In patients who exhibit these signs the prognosis is grave. The vascular system has become leaky, and can no longer hold fluid in its channels; both electrolytes and proteins pass through the damaged capillary endothelium into the tissue spaces. Anoxaemia is thus accentuated, and a vicious circle is established. It is difficult to know at what stage this process is irreversible and therefore when treatment by plasma will be merely wasteful. The guiding principle should be to institute adequate shock measures before this final state of "decompensation" is reached.

Few cases have been experienced in which serious haemorrhage has been a major factor. It has therefore not been considered necessary to use whole citrated blood to any great extent.

Estimating the Severity of Shock

The following sheet has been prepared to tabulate the data which are important in estimating the severity of shock, and from it and the classification of the degree of shock one can more certainly apply a rational mode of

therapy. It is hoped that some such sheet will be standardized by the Ministry of Health for use throughout the hospitals of the country. The data accumulated would thus be available for collection and analysis by those concerned with clinical research into the treatment of traumatic shock.

SHOCK DATA

Name Date
Time
T.
P.
R.
B.P.
R.B.C.
Hb.
Pallor Pain Thirst
Cyanosis Apathy Vomiting
Sweating Restlessness
Notes :

Comments

Following these raids there appear to have been few patients in whom early operation has been instrumental in saving life. Prompt amputation of mangled limbs has given disappointing results. Less than 5% of patients have required prompt operation for excessive haemorrhage. Profuse arterial haemorrhage was unusual even in patients with severed extremities, possibly because of the accompanying severe shock or possibly because the completely divided artery retracts and becomes constricted. Perforations of viscera accompanied by other multiple injuries were extremely rare and of grave prognosis. The majority of wounds were treated by the direct application of sulphanilamide powder. Post-operative infection and pyrexia were exceptional.

Summary

A basic scheme for the reception and preliminary treatment of air raid casualties is shown in diagrammatic form.

Emphasis is laid on organization for the rapid transmission of patients to the wards.

Charts for preliminary note-taking and estimation of the degree of shock are given.

So far, our experience has indicated that postponement of operative treatment until adequate resuscitation has been achieved is imperative.

We wish to acknowledge that the original scheme, modified since by our experiences, was worked out by Mr. A. J. Blaxland, senior surgeon to the hospital.

REFERENCE

Keith, N. M. (1919). *Med. Res. Cncl. Spec. Rep. Ser. No. 27*, p. 36.

Clinical Memoranda

Pneumococcal Meningitis treated with Sulphapyridine

This case is reported for two reasons: (a) the large amount of drug given; (b) the number of the relapses in the course of the disease.

CASE RECORD

The patient was a male child aged 4 years, with a history that three days previously he had complained of tiredness and pain in the right ear, and had a temperature of 99°. A day later he was still pyrexial, had become listless and anorexial, and was complaining of headache. On the day before admission he had started vomiting, was able to retain water only by mouth, and was complaining of a pain in the neck.

On examination classical signs of meningitis were present, with the temperature 102° and the pulse 120. Locally, the drum of the right ear was thickened, but not bulging. Lumbar puncture was performed, the cerebrospinal fluid being under

increased pressure, turbid, and microscopically showed many cells, predominantly polymorphonuclear leucocytes with Gram-positive diplococci, some capsulated. Culture gave a growth of pneumococci, which was typed and found to be Type 19. While awaiting these reports, chemotherapy with sulphapyridine (M & B 693) was instituted, 3½ grammes being given in the first twenty-four hours. No clinical improvement followed and further lumbar puncture was performed, the fluid being under slightly increased pressure, and cells 450 per c.mm., with lymphocytes predominant. No organisms were to be seen in the centrifuged deposit, and no pneumococci were grown on culture. The dose of the drug was then increased to 6 grammes in the twenty-four hours. Marked improvement ensued, with total disappearance of neck rigidity, and with the temperature 98° and the pulse 100. A maintenance dose of 1½ grammes a day was prescribed, but an exacerbation occurred with temperature 103°, and return of all signs of meningitis; sulphapyridine was increased again to 4½ grammes daily dosage for five days. In all, four such exacerbations occurred with intervals of a week between each. (It should be added that these recurrences took place the days after the child had been visited by its father.) Each recurrence was less severe than the preceding one and was treated with anti-pneumococcal serum Type 19, 20,000 units intramuscularly on three occasions, accompanied by increased dosage of sulphapyridine.

Search for the infective focus was made: an exploratory myringotomy on the right drum was performed, with no resulting pus or serum. Proof puncture of the antra Highmori was negative, but a nasopharyngeal swab gave pneumococci on culture.

The white cell counts made at intervals were consistent with presence of infection. Thus during an exacerbation the total white count was 19,000 per c.mm. Differential count was: polymorphs, 50 per cent.; eosinophils, 2 per cent.; myelocytes, 5 per cent.; lymphocytes, 41 per cent.; monocytes, 5 per cent. The last count, with the patient convalescent, was: total white blood cell count 10,500 per c.mm., the polymorphs being 41 per cent. and the lymphocytes 50 per cent.

SUMMARY AND CONCLUSION

- (1) A case of pneumococcal meningitis in a child aged 4 is described.
- (2) Several relapses occurred.
- (3) Large dosage of sulphapyridine (M & B 693) was necessary to effect improvement, 79.25 grammes being given in forty-six days.
- (4) Despite this there was no evidence of agranulocytosis.
- (5) Benefit of serum treatment is difficult to assess, as it was given concurrently with sulphapyridine.

My thanks are due to Dr. Pearse Williams for permission to describe this case; to Dr. Harré and Dr. Gwynne Evans for their reports; and to Dr. K. B. Rogers of St. Mary's Hospital for typing the pneumococci.

P. F. HOWARD DAWNAY,
House-physician,
Willesden General Hospital.

London, N.W.10.

B. Brouwer (*Ann. Paediat.*, 1940, **154**, 121) states that the number of vaccinations in Holland in 1924 was about 155,000 but fell in 1938 to 20,833. The large number of vaccinations in 1929 (1,469,914) was due to the outbreak of 449 cases of small-pox with the death of twenty-three persons. The considerable decline in the incidence of encephalitis is explained by the smaller number of vaccinations. A survey of the vaccinations in Holland from 1924 to the first three quarters of 1934 inclusive shows that among 22,000 children vaccinated in the first two years of life there was only one case of encephalitis (which recovered), while among older children there was one case to every 3,600 vaccinations and one death to every 13,000 vaccinated. As regards the pathogenesis of post-vaccinal encephalomyelitis Brouwer is opposed to the so-called "theory of activation," but agrees with those who consider the encephalitis as a direct consequence of the vaccine virus. He also regards endogenous factors as an accessory cause of the encephalitis.