of the latter, the response to streptomycin has been only temporary. Two cases of septicaemia without endocarditis due to *Ps. pyocyanea* or *Bact. coli* have responded satisfactorily.

Urinary-tract Infections.—A series of 61 patients with urinary-tract infection due to *Bact. coli*, *Ps. pyocyanea*, *Proteus*, *Staph. pyogenes*, and *Str. faecalis* has been investigated in 10 centres. In roughly half the cases the infection has been controlled by intramuscular administration of 3 g. of streptomycin daily for one to three days. Failure has almost always been due to the development of resistance. As with other antibacterial agents, streptomycin has a limited value where there is some underlying condition which is apt to lead to recrudescence of the infection.

Local Sepsis.—Fifty-five patients with local infections, have been treated. These include a wide variety of lesions such as infected burns, operation wounds, superficial ulcers, sinuses, abscess cavities, and septic skin conditions. The bacterial causes were similar to those detailed in the preceding paragraph. Daily applications of a saline solution of streptomycin (2 mg. per ml.) have been used either alone or combined with intramuscular therapy. The results are favourable, particularly in superficial lesions, provided that all necrotic tissue is removed. The employment of a standard technique is essential. Streptomycin has been used effectively as a cover for skin-grafting. In a proportion of cases failure has been attributable to the development of resistance.

Respiratory Infections.—Chronic lung infections due to bronchiectasis and lung abscess (14 cases) have been treated by inhalation and intramuscular injection. Although a temporary reduction in bacterial content of the sputum has been noted the cases showed little if any clinical improvement. The results of a preliminary trial in whooping-cough were inconclusive. More experience is needed of acute lung infections due to penicillin-resistant organisms.

Intestinal-Tract Infections.—Forty-two cases of infantile diarrhoea have been treated by oral administration of 2-4 g. of streptomycin spread over seven days. Sensitive organisms rapidly disappear from the gut. As the infecting agent in this condition is not always the same it was to be expected that the results obtained in different centres would vary. Some centres report clinical benefit, but so far treatment has not been sufficiently controlled to warrant any definite conclusions. Further trials, in which streptomycin will be given to alternate cases, are being undertaken. A small number of cases of ulcerative colitis and of typhoid fever have been treated by oral and intramuscular administration with negative results.

Summary

In this series of cases streptomycin has often been successful in controlling the following infections: (1) Meningitis: *H. influenzae*, *Bact. coli*, *Ps. pyocyanea*, *Proteus*, and *Staph. pyogenes*. (2) Septicaemia: *Bact. coli* and *Ps. pyocyanea*. (3) Urinary tract infection: *Bact. coli*, *Proteus*, *Ps. pyocyanea*, *Str. faecalis*, and *Staph. pyogenes*. (4) Local sepsis: *Bact. coli*, *Proteus*, *Ps. pyocyanea*, *Staph. pyogenes*, and haemolytic streptococcus.

There have, however, been examples of almost every type of infection in which the micro-organisms rapidly became resistant. Courses of treatment should therefore be planned to exert the greatest possible influence from the beginning. The effect of combining streptomycin with other agents, such as the sulphonamides, is under investigation.

Owing to the short periods of administration toxic symptoms have been unusual and of slight importance. Urticarial rashes and skin irritation at the site of local application have occasionally been noted.

"C.B.11": A NEW ANALGESIC DRUG

PRELIMINARY COMMUNICATION

BY

W. M. WILSON, M.B., F.R.C.P.Ed.

AND

R. B. HUNTER, M.B.E., M.B., Ch.B., M.R.C.P.Ed.

(From the Clinical Laboratory, Royal Infirmary, Edinburgh)

In experimental studies in human beings we have recently compared the pain-relieving properties of C.B.11 (4:4-diphenyl-6-morpho-linoheptan-3-one hydrochloride), pethidine, and physeptone (amidone). The method we used is a modification of that employed by Hewer and Keele (1947) in comparing the analgesic properties of physeptone, pethidine, and morphine. These authors, using a degree of ischaemic pain as their standard, found that the effects produced by 7.5 mg. of physeptone and morphine were equivalent to those of 75 mg. of pethidine. Because C.B.11 has been shown in recent studies (G. F. Somers, personal communication, 1947) to be a more effective analgesic than morphine in rats and of low toxicity we considered it was worthy of clinical trial in man.

Method

Ten volunteer medical students were trained to appreciate a degree of ischaemic pain produced by obstructing the blood flow to the arm by a sphygmomanometer cuff at a constant pressure of 220 mm. Hg. Following occlusion the subject contracted the flexor muscles of the forearm 60 times within the space of one minute. Contractions were then stopped and the ischaemia maintained, resulting in the development of a steadily increasing pain in the forearm. The degree of pain produced in five minutes was easily recognizable, and if the ischaemia was maintained it became intolerable in 10 to 15 minutes. The subjects were trained to recognize the level of pain reached in five minutes.

An intravenous injection of one of the three drugs under trial was then given into the opposite arm. On three separate occasions 5 mg. of C.B.11, 5 mg. of physeptone, or 50 mg. of pethidine was given, the order of injection being varied in different subjects. The analgesic effect of the drugs was estimated as follows: the degree of pain at the time of injection was tabulated as 100%; an appreciable reduction of pain as 50%; and reduction to a barely perceptible level as 20%. Records of the degree of pain experienced were made every minute until the pain again increased above the original level or it was evident that the quantity of drug given had not produced any analgesic effect. The results of the experiment are given in Table I.

TABLE I

	Pethidine 50 mg.	C.B. 11 5 mg.	Physeptone 5 mg.
Pain reduction to 20%	—	8	3
Pain reduction to 50%	—	1	3
No pain reduction	10	1	4

Discussion of Results.—In each case in which analgesia was produced the effect was apparent within two minutes and lasted as long with C.B.11 as with physeptone, the average duration being three minutes. After that period there was a rapid recrudescence of pain to above the original level with both drugs.

Side-effects.—With C.B.11 the injection was followed by transient dizziness, which did not last for more than five

minutes. Dizziness was slight or absent with physeptone or pethidine. With all three drugs there was a pleasant feeling of detachment, and with pethidine euphoria was marked in the majority of cases even though no relief of pain was noted. C.B.11 produced pupillary contraction in all 10 cases.

Clinical Study.—Eighteen patients suffering from pain of different types and of different degrees of severity were given C.B.11 in doses varying between 10 and 30 mg. The oral, intramuscular, and intravenous routes were all employed at different times. The results are summarized in Table II.

TABLE II

	No. of Cases	Complete Relief	Some Relief	No Relief
Coronary thrombosis	4	4	—	—
Teeth extraction	1	1	—	—
Pulmonary infarct	1	1	—	—
Pleurisy	2	2	—	—
Angina decubitus	2	—	1	1
Biliary colic	1	—	1	—
Gangrene	1	—	—	1
Sciatica	3	1	2	—
Neoplasm—secondary deposits	2	2	—	—
Miscarriage	1	1	—	—
	18	12	4	2

Given by mouth, 20 mg. of the drug produced analgesia in 20 to 30 minutes when the pain was not severe, the effect lasting for three to four hours. When the pain was more severe, as in cases of coronary thrombosis, a dose of 30–50 mg. was required to relieve the pain. No hypnotic effects were evident when the drug was given orally.

The intramuscular injection of C.B.11 produced relief of pain in 10 to 15 minutes—an effect which lasted two to three hours. Very little cortical depressant action was evident. The dosage used was 10–20 mg. Giddiness and vomiting were noted only in ambulant patients and not in those confined to bed.

Given intravenously in doses of 10–20 mg., analgesia was produced within two minutes and was accompanied by a feeling of dizziness, which passed off in a short time. The analgesic effect lasted for one to two hours.

Conclusion

This preliminary study suggests that C.B.11 is a potent analgesic, comparing favourably with physeptone, and is apparently more active than pethidine under the conditions of the experiment. In a short clinical trial it proved to be effective in the relief of some types of pain.

There is no evidence at present that C.B.11 is a drug of addiction.

We consider it is worthy of more extensive trial.

This study was suggested by Professor D. M. Dunlop, to whom we are grateful for advice and criticism. We are also grateful to Dr. H. M. Walker, of Glaxo Laboratories, for reports of the animal experiments and for supplies of C.B.11.

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ASPHYXIA OF THE NEWBORN TREATED BY ROCKING

BY

F. C. EVE, M.D., F.R.C.P.

AND

The Late N. C. FORSYTH, M.D.

The unexpected death of Dr. Forsyth in November, 1947, lays on me the duty of publishing his work, which he was about to do. At Malton (Yorks) he had a large practice in midwifery of about 90 cases a year. Since 1932, when I published my rocking method of artificial respiration, he applied it to all his cases of "white asphyxia"—11 cases without a death. Hence his experience is unique and notable.

In 1947 I reported the case of a drowned boy of 14 treated (manually) by rocking (Eve, 1947). He was beyond recovery, but the colour change in his cheeks from blue to pink showed that an oxygenated artificial circulation had been created and maintained. I was excited to hear from Dr. Forsyth that the same colour change had occurred in all his 11 cases *before* the first gasp. I interpreted this to mean that rocking had restored a circulation to the respiratory nerve cells, which *then* were revived enough to make the respiratory muscles gasp. The lungs, unexpanded at first, may supply only a modicum of oxygen, but apparently that is enough for the modest demands of the nerve cells provided their blood is renewed by a *circulation*; stagnation is quickly fatal, and is aggravated by accumulated CO₂. Those with "white asphyxia" suffer from the enfeebled circulation of shock. Hitherto our conscious goal has been pulmonary ventilation. The first lesson learnt from these 11 cases is that we must concentrate on providing an oxygenated circulation (indicated by a pink face) to the nerve cells. If these are still viable they will then produce respiration in the natural manner. *Restore the circulation and the respiration restores itself.* The infant's heart can survive much longer, and rocking forces blood through the heart muscle.

Schmidt *et al.* (1945) were experimenting on the "gaseous metabolism of monkeys' brains." Finally the animals were killed by letting them bleed through the catheters which had been tied in the jugular veins. When heart and respiration had ceased they found (by chance) that by sucking out more blood from the jugular veins by a syringe "respiratory activity could be restarted and maintained for some time. This was confirmed by subsequent similar experiments, provided the monkey was in good condition." Hence they suggest that prompt manual artificial respiration may revive electric-shock patients by creating movement of blood in the cerebral vessels.

This recent evidence strengthens my plea that in asphyxiated babies natural respiration may be started by rocking if the cerebral blood (stagnant in quiescence) can be moved onwards. The valves in the heart ensure that the movement will be towards the heart. It is rarely remembered that every millilitre of venous blood which can be coaxed from the rigid cranial cavity is inevitably (I think) replaced by a millilitre of arterial blood from the lungs.

The second new and important lesson learnt from these 11 successful cases is that rocking is certainly not harmful in shock, and appears to be beneficial. The treatment at present orthodox in these asphyxia cases is concentrated on shock, and consists mainly of quiescence and hope. If rocking is harmless in shock it seems to me far preferable to this stagnation treatment.

The delegates to the first World Health Assembly will have "five weeks of very hard work," according to Dr. Brock Chisholm, Executive Secretary of the Interim Commission, who points out that "for the newly formed W.H.O., the member nations, and the secretariat there will be a year of hard work in 1949 to implement the decisions of the Assembly. As for the peoples of the world there is just beginning a realization of the W.H.O. constitution, which stands 'for the enjoyment of the highest available standard of health for every human being without distinction of race, religion, political belief, economical or social condition.'"