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Use of Sulphanilamide (Para Amino Benzene Sulphonamide) in Experimental Poliomyelitis.*

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The effectiveness of sulphanilamide (para amino benzene sulphonamide) in the treatment of certain bacterial infections[1] suggested its trial in the treatment of a virus infection, experimental poliomyelitis. Though no reports of the use of sulphanilamide in any virus diseases have appeared, Long[2] has observed no improvement of concurrent common colds in patients receiving the drug for various streptococcal infections. Marshall and his associates[3] have shown that sulphanilamide diffuses readily through the tissues of the body, and into the cerebrospinal fluid, where it reaches a level slightly lower than that of the blood stream. Two bacterial infections of the meninges, Beta hemolytic streptococcal meningitis[4] and meningococcal meningitis[5] have responded well to sulphanilamide therapy.

Two series of *Macacus rhesus* monkeys were used in these experiments. The first 4 monkeys were inoculated by the intranasal route with 0.5 cc. of 20% fresh virus cord suspension in each nostril on 2 successive days; two of these monkeys received subcutaneous injections of 50 cc. of a 1% saline solution of sulphanilamide‡ (an amount equal proportionately to twice the maximal therapeutic human dose) twice daily, begun 3-4 hours prior to the first inoculation of the virus suspension; two were used as controls. In the second group, 6 monkeys received one cc. each of 15% virus cord suspen-

* Work supported by the President's Birthday Ball Commission for Infantile Paralysis Research.

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1 Long, P. H., and Bliss, E. A., *J. A. M. A.*, 1937, **108**, 32. A full bibliography is given here.

2 Long, P. H. Personal communication.

3 Marshall, E. K., Jr., Emerson, Kendall, Jr., and Cutting, W. C., *J. A. M. A.*, 1937, **108**, 12.

4 Arnold, J. G., Jr., *Ann. Int. Med.*, 1937, **10**, 8; Schwentker, F. F., Clason, F. P., Morgan, W. A., Lindsay, J. W., and Long, P. H., *Bull. Johns Hopkins Hosp.*, 1937, **60**, 4.

5 Schwentker, F. F., Gelman, S., and Long, P. H., *J. A. M. A.*, 1937, **108**, 17.

‡ Marshall (in work to be published) has shown that the blood sulphanilamide level 4 hours after one such injection is 12.7 mg.%, and after 8 hours, 11.1 mg.%. Practically all this is in the active uncombined form (though the urine contains 30-70% of the inactive acetylated compound). Such a concentration lies within the supposedly effective range of the drug in human blood.

sion in each nostril on 2 successive days; 4 were given sulphanilamide as above, while 2 control animals received 50 cc. of normal saline subcutaneously twice daily. Tables I and II show the course of these monkeys.

TABLE I.
First Series.

No. of Monkey	Day of Onset of Paralysis	Complete Paralysis	Day of Death	Remarks
				Treated with 50 cc. 1% sulphanilamide in saline s.c. b.i.d.
61	11	15	17	
62	8	—	—	Moderate flaccid paralysis of right arm disappeared completely by 12th day. Animal sacrificed on 17th day.
				Untreated Controls
63	12	14	22	Received 50 cc. normal saline s.c. b.i.d. 17th to 20th day.
64	8	9	9	Animal sacrificed when completely paralyzed and moribund.

s.c. = subcutaneously.

TABLE II.
Second Series.

No. of Monkey	Day of Onset of Paralysis	Complete Paralysis	Day of Death	Remarks
				Controls—Given 50 cc. normal saline s.c. b.i.d.
70	12	—	—	Animal showed severe paralysis of both legs and moderate paralysis of the arms. From the 27th day on he gradually gained in vigor, with slight decrease of paralysis.
71	9	10	17	
				Treated with 50 cc. 1% sulphanilamide in saline s.c. b.i.d.
72	10	14	24	Animal sacrificed when completely paralyzed and moribund.
73	9	12	19	
74	10	11	18	
75	10	18	24	When unable to feed themselves, this monkey and the others of this series were tube-fed twice daily with 200 cc. of milk containing egg and sugar.

s.c. = subcutaneously.

It is seen that in the 2 series of experiments 2 monkeys survived, one treated animal, after transient paralysis, and a control animal showing marked, but very gradually diminishing, paralysis. Such

survivals are not uncommon in untreated animals following inoculation by the intranasal route. In the other monkeys, as tabulated, there is no significant difference in the time of onset of paralysis, in the time of occurrence of complete paralysis of the extremities, or in the day of death, between the 2 groups. The results of these experiments fail to indicate any therapeutic value of sulphanilamide in experimental poliomyelitis.

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Beneficial Effect of Non-Saponifiable Fraction of Soy Bean Oil on Chicks Fed a Simplified Diet.

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Pappenheimer and Goettsch[1] have described a syndrome in chicks fed certain simplified diets. The syndrome was characterized by paralytic symptoms, and post mortem examination revealed definite lesions in the cerebellum. Recently Goettsch and Pappenheimer[2] stated that protection against the syndrome ("nutritional encephalomalacia") was afforded by the non-saponifiable fraction of certain vegetable oils, including soy bean oil.

It has been found possible to obtain confirmatory evidence of a beneficial effect of the non-saponifiable matter of soy bean oil when fed to chicks receiving a simplified diet. Crude soy bean oil* was treated as follows: To 500 cc. of boiling methyl alcohol (freshly distilled from potassium hydroxide) were added in order 1250 gm. of potassium hydroxide and 1000 gm. of crude soy bean oil. Heating was continued under reflux for one hour, whereupon 2500 cc. of boiling water was added. When cool, the resulting solution was first saturated with 3500 cc. of peroxide-free ether (prepared by shaking with 5% aqueous stannous chloride, until a sample gave no color with a colorless ferrous sulfate + potassium thiocyanate solution, and distilling), then extracted with 5 2-liter portions of the same solvent. Throughout the entire process, all apparatus was flushed with natural gas. The extracts were combined, washed first

[1] Pappenheimer, A. M., and Goettsch, M., *J. Exp. Med.*, 1931, **53**, 11.

[2] Goettsch, M., and Pappenheimer, A. M., *J. Biol. Chem.*, 1936, **114**, 673.

* Kindly supplied by Allied Mills, Peoria, Ill., through the cooperation of Dr. E. M. Hasbrouck.